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THE AMERICAN

GAS LIGHT JOURNAL

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[Special Editorial Correspondence, by Telegraph.]

THE PACIFIC COAST GAS ASSOCIATION'S SIXTH ANNUAL MEETING.

SAN FRANCISCO, CAL., July 21, 1898.

Dear JOURNAL: The sixth meeting of the Pacific Coast Gas Association was brought to a successful termination to-day, and it is the satisfaction of your correspondent to report that in using the word successful he employs a term that is as truthful as it is terse. From a technical standpoint the sessions were instructive and interesting, for the delegates were in close attendance when the papers were read, as will be seen by their speeches in discussion when the official report of the meeting comes to hand. The weather conditions were of the most salutary California type, the representation of the Coast's gas interests was individually important and wonderfully large (the roll call disclosed the presence of nearly 60 members), the executives were unremitting and happy in their attentions, the headquarters were excellent, the applications for admission to membership were beyond precedent, and the social side of the convention was praiseworthy to the last degree. We would have had more cause for exultation were the representation from the gas industry at large more pronounced, but the Western Gas Association was cleverly personated by its alert First Vice-President, Mr. I. C. Copley (of Aurora, Ills.), whose well-timed remarks in the discussion on some of the papers only proved anew that sections do not limit gas practice; that is, that good practice in the gas trade is quite alike, whether the practicer is from or of the north, south, east or west. The paper list was so voluminous, in addition to the President's Address, the "Wrinkle Department," the "Experience Department" and the "Question Box," that three of the numbers thereon were taken as read, simply because time would not permit of their being disposed of in the usual way. This rather goes to show that there is still a plenty of subject matter for the minds of those gas men in the trade who are disposed to use their pens for the transcription of thought to assist their fellows. The proposition to amend the Constitution, by changing the title of the Association to that of the "Pacific Coast Gas and Electric Association," was rejected by a practically unanimous vote; the speech of Mr. Albrich, of Spokane Falls, Wash., in opposition to the change or amendment, being specially well received because of its vigorousness and commonsense. The report of the Secretary showed how healthy the affairs of the Association are, from either a membership or financial standpoint; and indeed, it looks to me that a sectional Association which, in its sixth year, can assert a membership of 112, is to be congratulated on its strength. The banquet was a complete success, and the speechmaking that accompanied it was punctuated with a patriotic fervor and flavor which showed that the motto of in union there is strength still binds indissolubly our sailors, soldiers and civilians in mutually assisting fraternity. The outing to "Haywards," by trolley cars over and along the magnificent roads that bound the fruitful fields and fruit groves of Alameda county, was a perfect success, and those who participated in the ride and partook of the well ordered, well served luncheon at the "Club House," will cordially agree that their hosts—the Western Gas Construction Company and the Maryland Meter Company—were hosts indeed. In connection with this it might not be out of

place to note that Mr. Guldlin, of the one, and Mr. Duval, of the other named Companies, were present in person to do the honors. The officers elected were :

President—Mr. Charles F. Adams, Portland, Ore.
Vice President—Mr. John Clements, Red Bluff, Cal.
Secretary and Treasurer—Mr. John A. Britton, Oakland, Cal.

Those in attendance answering roll call were :

Adams, C. F., Portland, Ore.	Guldlin, O. N., Fort Wayne, Ind.
Adams, H. E., Stockton, Cal.	Green, J. E., San Francisco.
Burrows, E.C., Walla Walla, Wash.	Goodman, H. P., Napa, Cal.
Britton, J. A., Oakland, Cal.	Howard, J. L., San Francisco.
Boardman, W. F., San Francisco.	Hollidge, G. H., Merced, Cal.
Beck, A. C., Oakland, Cal.	Hitzeroth, L. D., San Francisco.
Crockett, J. B., San Francisco.	Jones, E. C., San Francisco.
Converse, C. M., San Francisco.	Joslyn, H. R., Woodland, Cal.
Clements, J., Red Bluff, Cal.	Jackson, G. W., Sacramento, Cal.
Cressey, F. A., Modesto, Cal.	Kaneen, J. C., San Rafael, Cal.
Cushing, S. B., San Rafael, Cal.	Knight, B. A., San Francisco.
Cline, W. B., Los Angeles, Cal.	Kinney, G. I., San Francisco.
Campbell, A. N., San Francisco.	Miller, C. O. G., San Francisco.
Cardiff, R., Santa Cruz, Cal.	Martin, D. E., Oakland, Cal.
Colquohoun, C. F., San Francisco.	Osborne, M. C., San Francisco.
Duval, W., San Francisco.	Parker, T. R., Napa, Cal.
Davis, R. J., San Francisco.	Petch, T. D., Eureka, Cal.
Eichbaum, F. H., San Francisco.	Poole, C. O., San Francisco.
Eichbaum, C. W., San Francisco.	Quilty, C. W., San Jose, Cal.
Ewing, E. E., San Francisco.	Rice, A. L., Riverside, Cal.
Fenner, R., San Francisco.	Randall, E. C., San Jose, Cal.
Fogg, J. F., San Francisco.	Scott, J. F., San Francisco.
Foveaux, F., San Francisco.	Steinmann, B. U., Sacramento, Cal.
Froelich, C., San Francisco.	Thomas, J. W., Vallejo, Cal.
Guthrie, S., San Francisco.	Taylor, G. H., Chico, Cal.
Gregory, O. M., San Jose, Cal.	Thompson, G., San Francisco.
Grimwood, J. B., San Francisco.	Weidenthal, S. H., San Francisco.
Grant, E. P., Modesto, Cal.	Wilson, G. W., Vallejo, Cal.
Gutsch, A., Fresno, Cal.	

When the proceedings have been regularly printed in the JOURNAL I am quite sure that the verdict of your readers will coincide with the verdict already rendered by the Pacific Coast Gas Association's members, that its sixth meeting was in every sense an unqualified success.—B.

BRIEFLY TOLD.

AN APPEAL ON BEHALF OF THE EDUCATIONAL WORK OF THE AMERICAN GAS LIGHT ASSOCIATION.—At a very late time this week we received a circular letter from the Committee appointed by the Council of the American Gas Light Association to supervise the educational work of the Association, which educational work was instituted by the appointment of a Committee in 1895. In view of the importance of the suggestions now made by the Committee, and which suggestions we heartily and unreservedly indorse, we prefer to postpone for a week their full presentation rather than mangle them now by condensing them. The main proposition in the Committee's suggestion is that a permanent fund for carrying on the educational work, so happily started and so generously supported, shall be raised. To use the words of the appeal : "In brief, the idea is to obtain subscriptions from gas companies and individuals to an educational fund, which shall amount in the aggregate to not less than $3,000 per annum, and that these pledges shall be for not less than five years, so as to insure the permanence of the work ; for it is believed that, if successfully prosecuted for five years, the future of this scheme can be looked forward to with confidence." This is the meat of the proposition, and it is our belief that the asked for fund will be guaranteed before the end of this year. Next week we will put the whole scheme clearly to the inspection of our readers.

NOTES.—Mr. Thomas J. Fisher has been appointed Superintendent of Lamps for Washington, D. C.——At the annual meeting of the Municipal Gas Company, of Albany, N. Y., a quarterly dividend of 2½ per cent. was declared. The following Directors were elected : A. N. Brady, Robt. C. Pruyn, Wm. McEwan, Horace G. Young, John G. Myers, John Howe and John Delehanty. Messrs. Howe and Delehanty were named to succeed Roswell P. Flower and E. C. Benedict.——The proprietors of the Derby Gas Company, of Birmingham, Conn., have reduced the net selling rate to $1.30 per 1,000 cubic feet.

Address of the President (Mr. James Stelfox) on the Occasion of the Thirty-fifth Annual General Meeting of the Incorporated Gas Institute.

Gentlemen, I have once more to express to you my grateful appreciation of the high honor you have bestowed upon me in electing me as your President for the present year. The only tendency towards a feeling of regret that you should have thought me worthy of so great a compliment is experienced as I find myself under the necessity of facing that most serious obligation which custom has imposed upon Presidents—the preparation of the Annual Address. If I had the power to convey to you any information not possessed by others, I might feel that there was some justification for occupying your time and attention; but our extremely well-conducted technical journals so promptly publish all matters interesting to the profession of gas engineering, and the Presidents of the various District Associations so ably deal with all such subjects in their addresses, that I feel hopelessly incompetent to claim your attention on the ground of anything new I have to bring before you. I shall, therefore, have to throw myself upon your kind indulgence, and ask you to consider the few remarks I shall make as intended merely to put on record the present position and prospects of the gas industry, and not as an attempt to tell you anything you do not already know.

Before proceeding to refer to gas matters in general, permit me to congratulate you on the prosperous condition of the Institute, both as regards its membership and also in respect of its financial condition. We are not only out of debt, but have a handsome balance of receipts over expenses ; and the special funds are in a thoroughly satisfactory state.

A review of the position of the gas industry would certainly be incomplete if no reference was made to the subject of electric lighting. I have not the slightest intention of dragging you through the mazes of comparative figures purporting to show the relative cost of the two systems of illumination—not that I have any objection to figures, but because I am sure you have had enough of them, and have quite made up your minds on the subject. I think I am right in saying that the electric light has never exercised a depressing influence over members of the gas profession. We recognize it as the youngest, and, shall I say, the most brilliant member of a brilliant family. Its capacities have been supposed to be so abnormal that a very protracted period of infancy has not been grudged for it. It has been praised and petted and rather spoiled by the coddling it has received ; and it would not have been strange if the elder children had at times felt disposed to give it a pinch or two, seeing that they were somewhat starved, and occasionally even had their pocket money seized, to satisfy the very great expense required for the youngster's education. And more especially would such a disposition have been natural when the child made no end of boasting that he was going to turn the rest of the family out of doors as soon as he could grow up. I do not, however, think that this feeling reached a high pitch ; and the worst that has been wished for the brilliant infant has been that he might soon become a big boy, and be able to earn his own living.

Electric lighting has not, except in special instances, interfered with the progress and prosperity of gas undertakings. On the contrary, it has largely helped to foster a demand for more light. The big gas lamp is the natural outcome of the arc light ; and the public now expect an amount of illumination in town thoroughfares which was never dreamt of 20 years ago.

As the demand for increased light has arisen, inventors have not been slow to provide us with improved apparatus. The regenerative burners introduced by Frederick Siemens have had many imitators, but no superiors. For business, and especially shop lighting, the users have been able to obtain a duty more than double that yielded by the standard burners, and three or four times that obtained from the burners in ordinary use. This progress, however, seems to be put quite in the background by comparison with the results obtained by means of the incandescent mantle, invented, improved and perfected by Welsbach. The pioneers of incandescent gas lighting could have had but little idea of the possibilities of the thorium-cerium mantle ; and so long as it was possible to obtain as much light per foot of gas by combustion with the ordinary burner as was given by an incandescent burner, the latter offered no attraction to gas engineers. I think we are bound to admit that no better result than this was anticipated, and when the extremely unpleasant color of the earlier incandescent lights is taken into consideration, it is little wonder that the system was relegated to a back shelf.

The genius of Welsbach, and the indomitable perseverance and pluck

of the chief officers of his Company were, however, destined to bring about a complete revolution in our ideas on the subject. The history of the great Company which has carried the new system to the highest eminence of commercial success is quite dramatic, and is known to almost everyone inside and outside the gas industry. The colossal fortunes reaped by those who have placed in the hands of every gas consumer the means of obtaining the light of 15 standard candles per cubic foot of gas, instead of the 3 to 3½ candles obtainable by the standard burners, or the 2 to 3 candles yielded by the ordinary consumers' burners, have been fairly won. The Incorporated Gas Institute has not been slow to recognize this, and the presentation of the Birmingham Gold Medal of the Institute to Dr. Carl Auer von Welsbach, and its acceptance by him at the Bath meeting last year, constituted a function conveying an honor to each of the parties concerned, and indicating the high estimation in which the distinguished inventor's services to the gas industry are held.

Having at one time had but little faith in gas lighting by incandescence, I am quite free to admit that I have been entirely converted. I have never been one of that ilk which would rather that the world should cease to revolve, than that any of its ideas should be proved to be fallacious. I therefore with pleasure refer to the great improvement in results promised by the new departure of the Welsbach Incandescent Company in the construction of their apparatus.

It will be fresh in the memory of the members that, in 1895, Professor V. B. Lewes introduced to our notice the brilliant burner designed by M. Denayrouze. This burner gave a light equal to 27 candles per cubic foot of gas; but unfortunately, in order to obtain this result, it was necessary to use an auxiliary motor to ensure the thorough admixture of the air and gas at the point of combustion. This naturally placed the burner in the list of scientific appliances, and precluded its use as an everday machine. A year or so later, a modified form was introduced, which did not require a motor; and those who attended the Institute meeting at Bath last June, had an opportunity of judging as to its efficiency in the Grand Pump Room. It did not give results equal to those obtained by the original burner, but was very satisfactory; and the display of its powers in the Westminster Aquarium in the spring of 1897 may have seen by many of you. As a practical contribution to the improvement of gas lighting, it seems to have been handicapped by the price demanded for it. Gas suppliers are largely dependent on a class of customers who cannot afford to put down comparatively big sums on capital account, no matter how theoretically economical the investment may appear on paper.

The new "Kern" burner, the ownership of which has been acquired by the Welsbach Incandescent Gas Light Company, promises to give results quite equal to those obtained with the Denayrouze motor burner, while it is free from complication, and is likely to come into the market at a moderate price. A very important feature in the new burner is that, instead of yielding a diminished amount of light when the gas pressure is increased beyond that for which it is rated, as in the case of the old burner, the intensity of the glow is increased as the pressure rises. It is thus possible to adjust the gas consumption so as to give a perfect incandescence of the mantle during the daytime, which becomes more and more brilliant with each increase of pressure. If this were the only advantage to be obtained, it would be a most important one; but when it is accompanied by an increase of illuminating power from 15 to 27 candles per foot of gas, the result must be the very general adoption of this system of lighting in the immediate future. These results are promised with the ordinary pressure of gas in town mains; but still better returns are to be obtained by the use of specially large mantles supplied with gas at higher pressures than are thus available. With a pressure of from 12 to 14 inches of water the Company claim to have obtained as much as 1,500-candle power from a single mantle, with a duty of more than 35 candles per foot of gas. The Directors have arranged for a display of their new appliances during the meeting, and have reserved the morning of Saturday exclusively for us; so that you will have an opportunity of seeing and investigating for yourselves the claims of this really wonderful system.

I have ventured to say that electric lighting has not acted to the prejudice of the gas industry. Allow me to qualify this expression of opinion. There are many communities supplied both by companies and corporations, in which the gas works have been kept in a state of deplorable inefficiency owing to the fear that the days of the industry were numbered. How often have we been told that it was moribund or dead, and yet it has been called upon to respond to the daily increasing demand for light. Timid directors or members of committees have thought it prudent to abstain from extending their works, with the result that the supply of gas at midwinter has become a source of infinite anxiety. Nor does the matter end with the strain upon the responsible officials. Of all sources of needless cost of production, one of the worst is congestion. Materials necessary for the reconstruction and repairs of works have to come in, and there is no space convenient in which to store them. They are stacked anywhere, and perhaps have to be moved over and over again before they are finally used. There is a temporary glut in the coke store owing to a month of mild weather, and there is nothing for it but a reduction of price to enforce sales, though the trouble may be merely temporary. The "penny-wise-and-pound-foolish" idea of saving ground space is one that cannot be approved of.

In places where a vast amount of plant is placed on a comparatively small area, the cost of labor, which would not be required if a reasonable amount of ground were available, greatly adds to the cost of production. In this respect our great railway companies have set us a good example. They have generally retained land along their routes, in order to admit of increase in their permanent way; and in such instances as their requirements have increased to an extent not provided for, they have not hesitated to obtain desirable additions, even at high rates. In connection with this subject, the report recently submitted by Mr. George Livesey to the Edinburgh Gas Commissioners forms most instructive reading. Mr. Livesey calculates that by abandoning an old congested works in favor of a new one, and adopting improved appliances, the city could effect a saving of something like £20,000 per annum—a sum large enough to pay 3 per cent. interest on an outlay of over £650,000. I do not suppose that in all works so large a proportionate saving as this could be effected; but I am certain that, in the case of a very large majority, the putting down of additional plant on ground already too small to permit of economical working has resulted in great additional cost, and the consequent maintenance of a higher price for gas than would otherwise have been necessary. No doubt the evil has in many cases been the result of the pressing necessity for a larger supply of gas. The acquisition of additional land is often a vexatious and tedious undertaking, and the requirements of the district may be urgent. Therefore a new retort house or gasholder has to be placed on ground which would more profitably have been employed as yard room; and as each additional movement in this direction involves the handling of an increased quantity of material and the diminution in the space available for dealing with it, the "hand-to-mouth" condition is soon arrived at, in which it has often occurred to me that the place resembles a large shop which is so completely occupied by counters that there is no room for the customers.

The moral of all this (for if we cannot practise we can moralize) is that we should look further ahead than we are accustomed to do when making our calculations for the future. I do not think it too much for the gas suppliers of to-day to think of the requirements of 20 years hence. If we allow the low price of oil or the brilliant "light of the future" to deter us from the discharge of this obvious responsibility, the time will surely come, either to us or to our successors, when our dereliction of duty will be only too apparent. If Brown, who has a prosperous business, will not keep his premises up to the requirements of that business, because he fears that some future Jones or Robinson will arise to share it with him, he will soon find that he has adopted the very surest method for hastening the advent of his expected competitors.

During the past year there does not appear to have been much to record as regards new methods of gas enrichment. The Peebles process, which I have always thought deserved a foremost place among the systems of oil gas making, does not seem to have continued to make the progress that was expected for it. The reason for this is not very evident; but apparently the separate production of a gas of such high illuminating power as that yielded by this apparatus has been found in practice to have some drawbacks, or the method would have come into more general use. It is understood that the separate manufacture of of oil gas is being carried on in Glasgow; and no doubt in good time the interesting results will be communicated to us.

The experiments in connection with the oxy-oil process, which were being made at Huddersfield, seem to have been abandoned. The voluminous reports and correspondence in connection with these trials have only sufficed to place us in a state of bewilderment as regards the result. It need only be said here that neither side has succeeded in convincing the other, and that any complete information must be looked for in the future.

Perhaps there has not been any subject in connection with gas affairs on which the public mind has been more exercised than the position and prospects of acetylene as a means of artificial illumination. There cannot be a doubt that suspicions as to its safety have been many and

serious. These may possibly have been intensified by the stringent regulations as to the storage of calcium carbide deemed by the Government necessary for the public safety. I might have chosen to refer at greater length to this most interesting subject; but as you will have the privilege of hearing from Professor Lewes all that is known about it, I will not run the risk of spoiling your intellectual appetites for the feast thus to be provided, by offering such scraps as are at my disposal. I will therefore only say that, brilliant and beautiful as is this latest claimant for honors, it has not yet come into practical use to any considerable extent; nor does it seem at all likely that it will interfere appreciably with the ordinary supply of gas in towns or villages. It is essentially a country house light; and for the illumination of mansions it may have a future, if it could be made clear that its use did not involve such serious risks to its patrons.

In the various laborious processes connected with gas manufacture the substitution of machinery for manual labor continues, though perhaps somewhat slowly, to make progress. During the past year, several large installations have been fixed, and the use of mechanical appliances extended in many works already having such. As to the desirability of employing machines in all work which involves great physical strain if effected by hand labor, there cannot be a moment's doubt. As to the economic question there will be greater divergence of opinion, as other matters—such as loss of coal by spillage and imperfect carbonization—must be considered, as well as the mere comparison of wages and wear and tear. No doubt the introduction of machines into retort houses not thoroughly suited for them, to a considerable extent affects the cost of working; and in many works, where the employment of mechanical power does not begin and end with stoking appliances, but includes the "handling"—if I may be excused for the misnomer—of the material from truck or barge to the coke store, a very substantial reduction is effected.

These labor-saving appliances must be reckoned to include the use of inclined retorts, which came upon us with a boom some thirteen years ago, and seemed likely to take possession by storm of every gas works in the kingdom. The adoption of the system seemed, however, to receive a decided check; and no doubt it has contributed very largely to that omnivorous receptacle the scrap heap. Nevertheless, as in the case of many other systems, out of that portion of the heap a vast amount of experience has been evolved; and at the present time "slopers" seem likely to have a much more prominent place in gas works construction than the one they have till lately occupied. I am personally obliged to our friend Mr. Shoubridge for consenting to give us the valuable information which he possesses on this subject; and I shall not therefore anticipate his description of the most recent developments of the system.

The probable effect of the new Workmen's Compensation Act, which will come into force on July 1, has excited a good deal of speculation; and since the insurance companies have expressed, by their high tariff, their estimate of the responsibilities which it will throw upon employers, there has been something approaching a panic in industrial circles. That there has been miscalculation somewhere seems certain, from the vastly different figures arrived at by the companies and the author of the Act. The subject will no doubt be fully discussed in connection wite Mr. Ellery's paper. If it can be shown that the Act will tend to add to the security of life or limb in our large manufacturing establishments, without unduly or unfairly taxing the proprietors, its addition to the Statute Book will be largely justified. This can only be judged by results; and for these we must wait till it has been for some time in operation.

The result of the adoption of Mr. Vernon Harcourt's 10 candle pentane burner by the Metropolitan Gas Referees as the standard for their official testing, in lieu of the time-honored sperm candles, will be looked forward to with much interest. It cannot be said that the change has been made hastily, seeing that the pentane standard was exploited as far back as fifteen years ago. Mr. Harcourt read a paper on the subject at the Institute meeting in 1883, and in his introduction he referred to the vagaries of the standard candle. Since that time the question of its adoption has been frequently discussed. It remains to be seen if, in its most recent form, it will obviate the difficulties and disputes constantly arising in connection with gas testing.

Now with respect to water gas, carbureted and uncarbureted, I think I may say that, so far as the former is concerned, it has been the greatest and most successful departure from old methods of gas making that has characterized the last decade of the century. Possibly by the early years of the coming century the latter of the two may come more prominently into use. But before this can be possible in the illumination of towns, the public mind will have to be convinced as to the superiority of lighting by incandescence; and perhaps it will be also necessary that some much cheaper and less fragile form of burner shall be available.

It is just four years since I had the honor of communicating to the Institute the results of six months' experience in the production of carbureted water gas by means of the Lowe double superheater apparatus, which had found so much favor in the United States of America, the birthplace and training school of the industry. At that time I had found, to my very agreeable surprise, that a system which I had only reckoned upon as a help in emergency was likely to prove an important factor in our daily work. After a further year's experience, so thoroughly satisfactory were the results that a large addition was made to the plant, and we have continued to work it without intermission till the present day. Increased intimacy in this case has led to increased appreciation. The drawbacks I expected, though they had but a shadowy existence, have not materialized. On the other hand, advantages never thought of have from time to time become apparent; so that in my own mind I am unable to conceive such a condition in that of another as would place him in antagonism to so efficient a standby in case of need. I suppose there are vigorous natures who revel in hard work and worry, and for whom the weary waiting for retorts to be ready for use affords some sort of penitential delight, of which they would not deprive themselves by merely turning on the tap of a water gas plant. Speaking for myself, I have had enough, and too much, of such experiences while they were unavoidable, and am only too glad to have the opportunity of availing myself of the comparatively quiet life rendered possible by the possession of efficient water gas appliances. It is a satisfaction to be able to receive a card conveying a friend's best wishes for "A happy Christmas," without necessarily feeling that one is being made the subject of satire or derision.

All this may be beside the question, inasmuch as economy must be considered, and, clearly, personal comfort must not be allowed to outweigh the interests of those whose property is placed under our control. There are many works too small for the profitable employment of a water gas plant; and there are others whose position may be such as to involve certain conditions as regards cost of coal or carriage of oil affecting the ultimate cost of gas to the advantage of the one system or the disadvantage of the other. Such cases must be dealt with on their individual merits. He is the ablest general who turns to best advantage such materials and appliances as are at his disposal, and who plans his campaign with the most careful regard to his surroundings and the obstacles to be overcome.

There are many who, with more or less imperfect knowledge on the subject, rail at carbureted water gas, who are indirectly largely benefited by its introduction into general use. In making comparisons between the two systems, it must not be forgotten that within the past few years the price of that almost obsolete enricher, cannel, has been greatly modified, entirely through the use of oil in one way or another in the enrichment of gas. In my own neighborhood, all the works are getting better prices for their residuals as the result of our manufacture of carbureted water gas. In this respect alone, if the public would only realize it, the new system deserves well at their hands. As regards our particular experience in Belfast, the effect of the change has been to bring down the cost of coal gas to a figure which could not have been reached on the old lines; and all the economy represented by the saving in cannel and the increased yield from residuals is credited to the cost of coal gas, though in reality it is achieved by the large use of water gas. It is therefore clear that, in cases where both systems are at work, the just claims of the newer one cannot be determined by the mere comparison of the figures as they appear in the accounts. That my own experience of the system is not an isolated one, is clearly shown by the fact that, whereas at midsummer of 1894 only three concerns were working it in the United Kingdom, in 1896 the number had increased to sixteen, and at the present time over forty works have adopted it; and the experience has been so generally satisfactory that we may claim for it a practically unanimous verdict of approval. It seems also clear the Gas Light and Coke Company, who first experimented with the plant in England, must have satisfied themselves of its economy, seeing that they have so largely increased their producing power in this direction.

As to the wonderful statements that from time to time appear in reference to the cost at which coal gas can be produced, I desire to touch but lightly upon them. Figures may be so arranged as to prove anything, so long as they are merely selected figures. The compilations annually published in "Field's Analysis" are open to the inspection of all. They include the returns of leading undertakings whose united production of gas represents more than half of the entire production of the kingdom. At a recent meeting of the North of England Associa-

tion, Mr. David Terrace claimed to have produced carbureted water gas of 24 candles at 14d. per 1,000 cubic feet into the holders, though he had to bring his oil on to the works in railway tank wagons. With oil tanks *in situ*, and direct communication for discharging tank steamers, he reckons this cost would be reduced to 11.7d. per 1,000 cubic feet. I do not think these figures represent the best that can be done with oil at 2d. per gallon, or possibly a little under that figure. But they are good enough to compare very favorably with the best of those tabulated by Mr. Field; and so long as these tables are allowed to pass as accurate, we must accept their testimony as reliable.

For the use of carbureted water gas, however, I venture to claim other economies than that of mere cost of working. To give the results of personal experience, I may mention that a complete water gas plant, capable of producing 4½ million cubic feet per diem, cost us less than £24,000, including the necessary buildings. Existing condensers, purifiers and exhausters, unfortunately not equal to the total capacity of the plant, were utilized; but an outside estimate of the cost of these, sufficient for the full requirements, would be:

For condensers	£3,000
For exhauster and house	1,500
For purifiers	8,000
	£12,500

This makes a total of £36,500. With such a plant at full work, one could depend upon a production of 28,000,000 cubic feet in a week, which would be at call at any moment, to be used or held in abeyance as circumstances required. A gasholder to contain 7,000,000 cubic feet would cost, with tank, at least £70,000; so that, as an emergency plant, the gasholder would cost double and give but one-fourth the security afforded by the other. The accumulation of stock in a gasholder can, in case of any sudden demand, only be used once; while a producing plant capable of being promptly brought into action represents a continuous relief. In former years the advent of a dark week meant with us the hurrying up of extra settings and the frequent checking of pressure so as to avoid the "no bread" condition at the week end by providing only the "half-loaf" at the beginning. Since we have worked the new system, the necessity to reduce pressure has never occurred; but, on the contrary, when a period of special darkness has been experienced, we have been enabled to give the extra supply which was required, seeing that through the winter months we have always kept an extra set alight—working two sets alternately, and when necessary keeping both in action.

Now, what is the objection to the employment of this system? I have designedly used the singular number, because I think the only allegation worthy of notice is that the carbureted water gas contains a larger proportion of carbonic oxide than coal gas. It is surprising how the public mind can be influenced by "a cry." From the time when the prestige of "Diana of the Ephesians" seemed to be in peril to the present, persons more or less interested or fadded about certain things have appealed in this way to the popular feeling. The votaries of Old King Coal have not been exceptions to the rule; and though colliery owners and agents are usually not men wanting in intelligence, and therefore not silly enough to openly declare war against a supposed enemy on insufficient grounds, they are possessed of enough human nature to be capable of taking advantage of, and encouraging in a quiet way, any feeling that may seem to be unfavorable to their opponent.

The results of the valuable researches of Dr. Haldane, as to the action and effects of carbonic oxide, have in some quarters been most unfairly, and in many cases most ignorantly, used. That some of the medical journals should have committed themselves to such statements as that carbureted water gas is specially dangerous on account of the absence of smell, must seem strange to those who know how pungent and disagreeable is the effect produced by the smallest escape of the gas. With those who have associated themselves with the opposition to the use of carbureted water gas, there seems to be no element worthy of consideration but the one. Accidents from coal gas crop up from time to time; but they are of no consequence, because in coal gas carbonic oxide is only present in the proportion of 6 to 10 per cent. Therefore people poisoned by that gas die by misadventure. If they inhale a mixture containing water gas with (say) twice the proportion of carbonic oxide, the case seems to assume quite a different aspect. As a matter of fact, there are other very deadly ingredients in coal gas, though their characteristics are not so well known as those of carbonic oxide. But the fact remains that coal gas, if inhaled in any quantity, usually kills, and carbureted water gas can do no more. The recoveries from asphyxiation appear to be quite as common with the one gas as with the other. In neither case is the material supposed to be used as a tonic; and ample warning of its presence is in each case given to anyone possessed of the slightest sense of smell.

Accidents will happen even to those exercising the utmost care; and if people will blow out their gases, or prefer to turn on their gas taps before finally retiring to rest, the vendors of a useful commodity which is supplied for external use only, are surely not to be blamed for such negligence. Used as an illuminant, carbureted water gas is hygienically superior to the other; and even when inhaled, the results in practice do not seem to be any worse. Careless people and children get burnt, yet house fires are not discontinued. Drowning fatalities occur, but no one suggests that our rivers, canals or lakes are features to be regretted. Electric currents kill, but the suppression of electric lighting is not therefore advocated. If our medical friends, professional and journalistic, would devote their great energy and undoubted ability to the amelioration of the sad condition of the country as regards preventable diseases, they would be conferring upon the community a much greater benefit than they can possibly achieve by creating needless alarms in reference to the dangers of illuminating gas.

It would appear that Dr. Haldane does not look upon the presence of carbonic oxide in practice in that pessimistic manner that some of the coal gas enthusiasts have imagined. In his evidence before the Board of Trade Committee concerning the ventilation of the Metropolitan railway tunnels, after referring to the impure state of the atmosphere contained in them, he says: "There is no reason to suppose that regular exposure to the atmosphere of the tunnel produces permanent ill-effects or shortens the life of any healthy person." In reference also to the pollution of the air in factories, he states: "There is perhaps no other occupation in which men are so constantly exposed to air containing noticeable percentages of carbonic oxide; and it is a fact of considerable interest that no permanent ill-effects are produced in persons accustomed to the air." Dr. Haldane also refers to the somewhat remarkable fact that the men employed on the Underground Railway "are exceptionally healthy, in spite of constant exposure to the impure air;" and still more astonishing is it that, in the Provident Society connected with the railway, the amount of sickness among those classes of men working in the tunnels is barely more than half of the proportion of that of the men employed in the workshops of the Company. I do not, by quoting these facts and figures, attempt to argue that carbonic oxide, or any other constituent of coal or carbureted water gas is desirable in the atmosphere we have to breathe, but merely to show that the presence of small percentages of these gases is not so deadly a matter as it is sometimes represented to be.

In the interesting lecture delivered by Professor Lewes at the Bath meeting in June last year, the lecturer foreshadowed a great lighting future for plain water gas used with Welsbach mantles. The learned Professor, in the same connection, referred to the results obtained by the Dellwik system, by which 77,000 cubic feet of water gas were produced from a ton of coke; and since that time upwards of 91,000 cubic feet are said to have been made per ton. As justifying Professor Lewes' anticipations, it is interesting to find that the lighting of the Vienna General Hospital by plain water gas made on Dr. Strache's method has since been satisfactorily accomplished. The results claimed are that, for a given amount of light, the heat developed was only about a third of that produced by a similar burner consuming coal gas, and the production of carbonic acid only one-half; while comparing it with the products of coal gas consumed in ordinary burners, the heat produced was only one-eleventh, and the production of carbonic acid less than one-seventh. The faculty in Vienna seem to be quite able to appreciate the hygienic superiority of the system, and it is something in the way of a commentary on the fanciful objections of which we have heard, that the experiment should have been made in a hospital.

That such a system is likely very soon to supersede the use of ordinary illuminating gas, I should be slow to prophesy. More probably the tendency will be to produce gas of lower lighting power, so that, while not shutting out those who still wish to use the old burners, it may be possible to provide those who adopt incandescent lighting with a supply at a cheaper rate. Possibly a cheap burner and mantle may be made available, and with the fact plainly in view that a non-luminous gas admirably suited to such a system could be made for one-fourth of the cost of producing ordinary gas, it would not be surprising if at a very early period the incandescent system should become the universal one.

The supply of such a gas would have most important results on the production of power for industrial purposes. Mr. T. O. Paterson, of Birkenhead, has favored me with the results of some experiments on the use of uncarbureted water gas in a gas engine, and I regret that he did not consent to submit them in the form of a paper at the present

meeting. I trust, however, the occasion is only postponed. The results of many trials with varying loads were as follows:

Town gas (25 per cent. carbureted water gas).....	24.9	cubic feet	per brake horse power	per hour.
Carbureted water gas....	27.6	"	"	"
Uncarbureted "	44.1	"	"	"

These consumptions the experimenter reckons would be reduced, if a modern engine were in use, to—

Town gas.....	15.0	cubic feet	per brake horse power	per hour.
Carbureted water gas....	16.6	"	"	"
Uncarbureted "	26.5	"	"	"

Mr. Paterson reckons his cost of plain water gas at 2¾d. per 1,000 cubic feet into the gasholder, taking coke at 7s. per ton. With such fuel available, containing over 90 per cent. of combustible material, and at a time when motors are not only "in the air" but in the streets, surely it would be more reasonable to expect in this direction the development of a system of tramway traction than in the many more pretentious and costly methods continually under discussion in all our large towns. It would seem that the first vehicle to be successfully worked by a motor should be a tramcar, and that the proper method of obtaining the necessary power would be found in the use of cheap gaseous fuel in an engine acting directly on the axles of the vehicle. Such a method of propulsion is successfully at work in several places with ordinary town gas. It is reasonable to suppose that when once the principle is firmly established, the production of the cheaper fuel—not necessarily, but in all reasonable probability, supplied by gas undertakings—will follow as a natural result.

Taking a comprehensive view over the field of artificial illumination, I think we may fairly congratulate ourselves on the position held by our own particular section. There is an old saying that "threatened people live long;" and possibly the sentiment may apply equally to industries as to individuals. At any rate, while stock in some of our supposed competitors is looked upon with suspicion, and is worth a good deal less than 20s. in the pound, gas shares continue to bring in good returns and command high prices. The future may have many surprises in store for us. But the system has yet to be invented or discovered which is to depose that of gas lighting from the commanding position which it occupies as pre eminently the Light of the Present; and it is with this period we are most concerned.

On a New Form of Water Blast.

[By Mr. Bertram B. Boltwood, in *Am. Chem. Jour.*]

Various forms of apparatus have been devised for supplying compressed air to blast lamps, small gas furnaces, etc., where relatively small volumes of air at low pressures are required. Of those forms which make use of the action of a small jet of water, one designed by Richards, and another described by Muenke, have found the widest application. Both of these appliances operate on the injector principle. A small jet of water is projected through the narrow orifice of a tube of gradually increasing diameter. The jet of water sweeps with it a considerable volume of air, which, together with the water, passes into a receiver, where the two are separated. The efficiency of this action is increased by the introduction of a projecting step in the injector tube, or by giving the form of an undulating curve to the tube itself. This deflects the jet, diminishing its velocity and causing it to completely fill the tube.

The effectiveness of this form of apparatus is, however, limited. This follows as a necessary result of the system upon which it is constructed. The orifice through which the jet passes must, of course, have a greater cross-section than the jet itself, for otherwise no air would be drawn through it. If the size of the orifice be increased beyond this, the efficiency reaches a certain maximum, beyond which any further increase in the size of the orifice causes a reduction in both the pressure and the volume of the air supplied. With the maximum free space, which must necessarily be small, for the admission of air, about the circumference of the jet, the friction experienced by the air in passing must be very considerable.

In the blast which is here described the objectionable features mentioned above have been done away with, and as a result the efficiency of the apparatus has been greatly increased.

The essential parts of the apparatus are the following: The receiver *A*, having the form of a cylinder, 8 inches in height and 6 inches in diameter, divided into three compartments, *b*, *c* and *d*, by the partitions *p* and *p'*, there being a circular opening 2 inches in diameter between *b* and *c*, and two smaller openings between *c* and *d* (as shown in Fig. I.); the injector tube *l*, 7½ inches long and ⅝ inch outside diameter, provided at the top with the small funnel-shaped projection *g*; the outlet tube *f*, having a diameter equal to to that of *l*, extending upward from *c* and curving over and downward to *g*; the tube *t* ($\frac{1}{16}$ inch diameter) opening into *f* and extending to *g*; the stopcock *s* opening into *d*; and the nozzle *k*, having an orifice $\frac{1}{16}$ inch in diameter, attached to the upper part of the tube *f*. The upper part of the tube *f* is bent slightly out of the plane of section in order that the axis of *k* and *l* may *exactly* coincide.

The action of the blast is as follows: The cock *s* is opened and the water is turned on. The jet of water issuing from *k* passes through *l* and falls into the compartment *b*. When the level of the water in *b* rises above the lower end of the tube *l* a considerable volume of air is

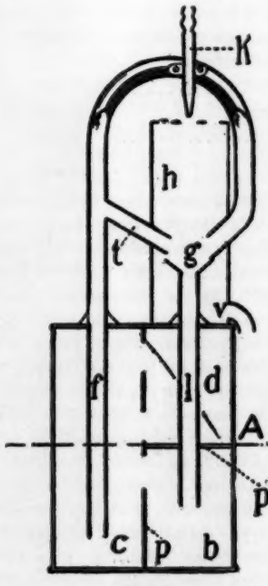


Fig. I.

Fig. II.

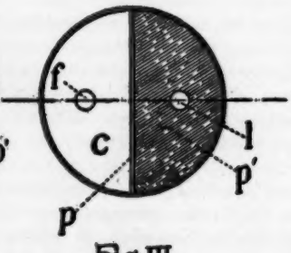


Fig. III.

swept into *A*. This air escapes through *f* and *s* and later through *s* only. The water flows from *b* into *c* through the opening in the partition between them. The cock *s* is now closed and the increase of pressure in the receiver causes the water to be forced up through *f* and into *g*. The jet from *k* now strikes upon the surfaces of the water in *g*, and, sweeping with it a large volume of air, drives it downward into *A*. If the cock *s* be now opened, a stream of air of a volume and pressure sufficient to supply a large blast lamp will be obtained.

The manipulation of the apparatus in practice is extremely simple. The proper adjustment of *s* for giving the maximum efficiency is readily determined. A glass water gauge attached to the outside of *A*, and connected with the compartment *c*, is very convenient, but not at all necessary. Spattering is prevented by surrounding *g* with a cylindrical case *h*, having openings in the top to allow the entrance of air, and an overflow pipe *v*, for the escape of the water. When the blast is set up in a permament position it is best to place it well below the level of the blast lamp bench, and to make the connection between the compartment *d* and the stopcock *s* by means of a pipe at least 1 inch in diameter. This will prevent any water from reaching the lamp, in case *s* is not properly adjusted. When *s* is attached directly to the receiver, as shown in Fig. II., a good sized bottle, inserted between *s* and the lamp, will serve the same purpose.

Fig. I. is a vertical section of the complete apparatus; Fig. II. is a projection from directly above, and Fig. III. is a section through the middle of the receiver.

The advantages of this form of blast are: That the orifice offered for the entrance of water and air is of such ample size that any considerable friction is avoided; that the injector tube is perfectly straight and free from any obstruction, so that the jet of water is not deflected and the maximum effect is obtained; and that the energy of the jet is transmitted to a much greater volume of water, which circulates continuously through the apparatus, flowing from *f* through *l* and acting as a piston which completely fills the cross section of the tube.

Two points of construction are absolutely essential to the satisfactory working of the blast. The shape of the nozzle *k* must be such that the

jet of water from it is perfectly cylindrical and unbroken for at least 15 inches of its length, and the jet must pass *exactly* through the longitudinal axis of the tube *l*. The latter requirement is most easily assured by leaving the attachment of the bottom of the receiver until the last, and setting the nozzle so that the jet falls in the proper position.

Many tests were carried out in order to determine the efficiency of the blast described in this article as compared with that of the blasts of Richards and Muenke. The volumes of water consumed and of air furnished were measured in each case. The results are given in the following table:

	Volume of Water Consumed per Minute.	Volume of Air Supplied per Minute.	Ratio.
Muenke.....	5.1 liters.	5.5 liters.	1.1
Richards.....	6.6 "	7.2 "	1.1
New form.....	2.7 "	8.1 "	3.0

The pressure of the water used was the same in each case, and was not more than 100 feet. The air was measured at atmospheric pressure.

Shields' Apparatus for Manufacturing Gas.

On May 24th U. S. Letters Patent (No. 604,427) were granted to Mr. Henry C. Shields, of Troy, N. Y., for "certain new and useful improvements in apparatus for the manufacture of gas." The inventor's specification declares that:

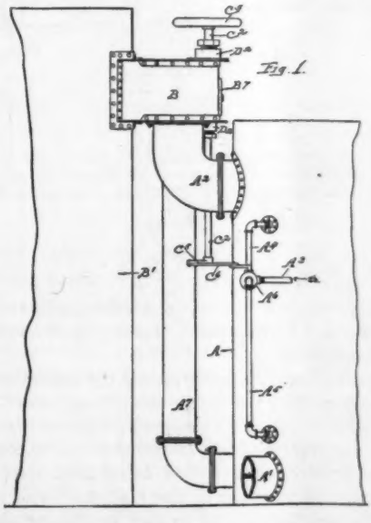
Figure 1 of the drawings is a view in side elevation of portions of a gas generator and fixing chamber, showing pipe connections, valve case and valve operating mechanism. Fig. 2 is a top plan view of the same. Fig. 3 is a vertical section of the main valve case, taken on the broken line 3 3 in Fig. 2. Fig. 4 is a face view of the main valve detached. Fig. 5 is a side elevation of one of the removable valve seats detached.

The principal object of the invention is to provide a main valve that will be durable and that can be easily and quickly operated to form one of the steps necessary to reverse the currents in a gas generator to produce "up and down runs."

I have shown the gas generator A provided with the usual blast pipe A^1 at the lower end, the upper exit pipe A^2 for taking off the products of combustion and gases, the steam pipe A^3, leading from a steam boiler to an upper branch A^4, entering the upper end of the generator, and a lower branch A^5, entering the lower end of the generator. A 3-way cock A^6 is adapted to alternately deliver the steam to the upper and lower branches. The generator is also provided with a gas pipe A^7, leading outwardly from the lower end of the generator.

The two pipes A^2 and A^7 lead to the valve case B, which is shown attached to and opening into the upper end of the fixing chamber B^1.

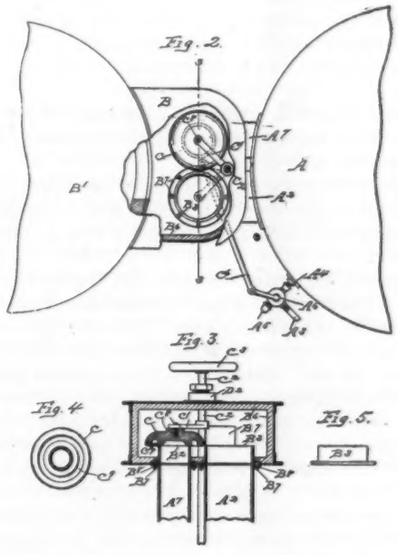
When an up run is to be made, steam is admitted through the lower branch to the lower end of the generator, and the gas or decomposed



steam leaves the upper end of the generator through pipe A^2 and, passing through the valve case, enters the fixing chamber, the pipe A^7 being closed.

To make a down run the steam is admitted through the upper branch into the upper end of the generator, and the decomposed steam passes from the lower end of the generator through the pipe A^7 and thence through the valve case into the fixing chamber, the pipe A^2 being closed.

As a means for alternately closing and opening the pipes A^2 and A^7 I provide the valve disk C, which is centrally pivoted upon one end of the crank arm C^1, the other end of the arm being fixed interiorly of the valve case upon the operating crank shaft C^2, rotatively movable in bearings in the shell of the valve case and provided with an operating handle or lever C^3, fixed upon a part projecting exteriorly of the valve case.



At the upper ends of the pipes A^2 and A^7 I provide valve seats B^2 and B^3, located within and attached to the case and projecting a short distance above the bottom of the case. The seats terminate in approximately the same horizontal plane in close proximity to each other, so that a rocking movement imparted to the shaft C^2 will swing the valve from one seat to the other in such a manner that the operation of closing one pipe opens the other pipe.

By connecting the valve operating shaft with the three-way steam cock A^6, as by lever C^5 and link C^6, the rotative movement of the shaft which operates the valve also acts to operate the steam cock, whereby steam is admitted to the upper end of the generator when the pipe A^2 is closed and to the lower end of the generator when the pipe A^7 is closed and pipe A^2 opened. Such arrangement and connection of the respective valves render it impossible to accidentally admit steam into the lower end of the generator when the pipe A^7 is closed, thereby obviating accidents, which would materially retard the useful operation of the apparatus, and at the same time facilitating convenience in successful operation.

Heretofore slide gate valves have been extensively used, one for each of the pipes A^2 and A^7; but the intense heat to which the seats of such valves, as well as the valves themselves, are subjected, causes large expansion, and the variation of expansion due to variation of heat when the valves are opened and closed renders it difficult to produce a tight joint. The wearing away of the parts due to the contact of cinders and ashes carried through the pipes by the strong currents of air and gases soon causes such valves to leak, thereby materially impairing the successful operation of the apparatus.

In my improved form of valve the seats are attached to the bottom of the valve case over the connecting pipes and project above it to allow space for ashes and cinders to lodge without interfering with the operation of the valve. The valve itself is preferably a heavy piece of metal having a smooth, plane face which slides across the seats. A pin C^8 is tapped into the center of the valve, being passed loosely through an enlarged aperture in the end of the crank arm. The valve is held to its seat by gravity, its weight being sufficient to tightly close the opening through the valve seat. As the valve when operated is caused to slide back and forth from one pipe seat to the other its action is to grind the seats and the face of the valve smooth, thereby automatically maintaining a perfect, tight fitting joint, greatly enhancing the durability of the parts and insuring perfect action.

The pin C^8, passing loosely through the crank arm, forms a swivel connection between the disk and arm, which permits the disk to rotate

upon an axis central to the pin, as the disk is forced to slide from one seat to the other. Such rotary movements cause different surfaces on the disk to engage the seats when the slide movements take place, thereby maintaining a uniformly polished and plane surface on the disk instead of a grooved or uneven surface, which would result from the slide movements if the disk were non rotatively supported and moved by the arm. The construction is such that the valve rests upon one or both pipes and moves on them in an approximately horizontal plane. The loose pivot allows variations in the plane of the movement. This insures the proper operation of the valve in case either pipe is bent or warped from its normal position, as is liable to happen owing to the high temperature to which they are subjected, and particularly the larger pipe.

The valve case is lined with refractory material B^6, and is provided with a door B^7 on the side, affording easy access to all the working parts of the valve.

When one of the pipes, as A^2, is larger in diameter than the other pipe, as A^1, the valve common to both is made of sufficient size to close the larger pipe and allowed to overlap the seat of the smaller pipe, as shown in Fig. 3.

When desired, the face of the valve may be provided with an annular groove C^9 larger in diameter than the diameter of the smaller pipe, and smaller than that of the larger pipe. Such groove tends to prevent the warping of a larger valve and maintains a plane surface on its face.

By making the valve seats B^2 and B^3 of separate detachable pipes or nipples or thimbles, which are secured in place by bolts B^7 and nuts B^8, I am able to renew or repair the seats without disturbing the relative positions of the case and pipes. This is a very important feature of my invention for the reason that the pipes are very large and rigid and the valve case very heavy and practically immovable, and if these parts should be disconnected, after having been subjected to the intense heat required in operating the apparatus, it would be a very long and difficult operation to reunite the case and pipes, so as to produce a tight joint.

By making the bottom of the case of sheet metal I am able to secure a tight joint between the pipes, the seats and the sheet metal by means of the nuts and bolts, which joint will not be injured by the slight variation due to heat expansion of the several pipes and other parts, and the bolts will be protected by the refractory lining, as shown. Sheet metal not only provides for more readily making tight joints, but such joints are less liable to be opened by expansion due to heat, and the metal about the joints is less liable to be cracked, for the reason that sheet metal has flexibility, and though this results in small variations in the level of the mouths of the pipes, the valve, by its wearing action, and more particularly by its loose pivot, is adapted to accommodate itself to such variations.

By providing the valve case with a door B^7 on the side of the case I am able to obtain easy access to the interior parts for the purpose of renewal or repairs. The door may be secured in any well known manner.

The valve case is provided with a packing box D^2 of any well known form to produce a tight joint with the valve operating crank shaft C^2, wherever the same passes through the shell of the valve case. Since the shaft has no slide or endwise movement like the stem of a slide gate valve, that portion which is contained in the packing boxes never comes in contact with the confined gases, and a tight joint is easily maintained.

In constructions where the valve stem slides through a packing box into a gas chamber the action of the hot gases upon the stem roughens it, so that the roughened stem soon tears and wears the packing sufficiently to cause a leak through the box.

I am aware that two alternately used gas conduits have been combined with a valve sliding in ways endwise of itself across said conduits, a part of the operating mechanism being situated in one of the conduits, and such device is not of my invention. My improvement is characterized by a case having an area larger than the combined transverse area of the gas pipes, said pipes extending into the case above its bottom and adapted to be covered alternately by a valve moving loosely on and over the pipe mouths about a point situated outside said pipes, none of the operating mechanism being situated within either pipe. The case is adapted to receive and hold the ashes swept by the valve from the valve seat. The valve is uniformly worn on its bottom. It readily follows moderate variations of the level of the pipe mouths and its operating devices are not of a kind to be easily affected by heat, and are also removed from the direct path of the hot gases; and, further, the case is improved, as elsewhere herein pointed out.

What I claim as new, and desire to secure by letters patent, is:

1. In a valve, the combination of the valve case, pipes situated side by side and extending above the floor of the case, a pair of valve seats on the ends of said pipes in approximately the same horizontal plane, a perpendicular crank shaft approximately equidistant from such seats and extending from the interior through the case wall, a crank arm secured to such shaft interiorly of the case, a slide disk movable on and along the seats, a swivel connection between the disk and crank arm, the pin of said connection being the center of the motion of the valve, and means located exteriorly of the case for communicating rocking movements to the shaft.

2. In combination a valve case, pipes extending through its bottom and above the same, the valve pivoted at a point outside the circumference of the pipes to swing on and across their mouths in an approximately horizontal plane, a shaft supported in the case wall and fixed against endwise motion, and devices intermediate the valve and shaft, whereby the rotation of the latter alternately covers and uncovers each pipe mouth, substantially as described.

3. In a valve, the combination with the valve case, said case having a sheet metal side with a pair of openings, pipes extending through said openings, the valve disk and means for operating the disk, of a detachable nipple seat registering with each case opening, and means for detachably securing the nipple seats to the sheet metal wall of the case, substantially as described.

Hirt's Apparatus for Eliminating Naphthaline from Gas.

On February 8th last U. S. Letters Patent (No. 598,707) were issued to Mr. Louis J. Hirt, of Brookline, Mass., for an improved method of extracting naphthaline from gas made from coal or from other materials.

Using the words of the specification:

In accordance with this invention the gas, which may be produced in any usual or well known manner, is reduced in temperature and brought into contact with, preferably, a plurality of removable surfaces within a suitable apparatus or chamber and upon which the naphthaline in the gas is deposited in crystalline form. The gas freed from naphthaline may be collected in a suitable holder, and the naphthaline deposited on the removable surfaces may be dissolved in naphtha or other solvent by removing the collecting surfaces and immersing them in a vessel or tank containing the solvent.

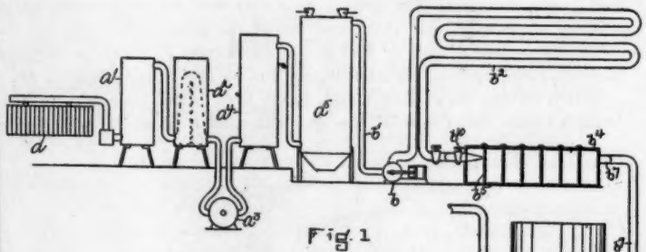


Fig. 1

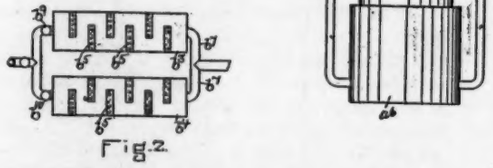


Fig. 2.

Figure 1 represents in elevation a coal gas plant provided with a naphthaline extracting apparatus embodying this invention, and Fig. 2 a detail to be referred to.

In the present instance I have shown my invention as employed in connection with a coal gas plant, comprising retorts a, cooler a^1, tar chamber a^2, exhaust pump a^3, ammonia tower a^4, and gas purifier a^5, which apparatus may be of any suitable or desired construction.

In accordance with this invention the gas from the purifier is reduced in temperature before passing to the holder a^6 or to the service pipes, and this result may be effected by first increasing the pressure above that of the gas in the purifier and then reducing the temperature to or below the point at which the naphthaline crystallizes out and obstructing the flow of the gas, so as to cause the naphthaline in the gas to be deposited upon surfaces preferably capable of being removed from the course of the gas, so that they may be immersed in suitable vessels or tanks containing naphtha or other solvent for the naphthaline.

The pressure of the gas passing out from the purifier a^5 may be increased by a suitable pump or engine b of any suitable construction, which, as herein shown, has its inlet port connected to the outlet pipe b^1 of the purifier and its outlet port connected to a refrigerating apparatus represented as a coil of pipes b^2, which in practice are cooled by water running over them, so as to reduce the temperature of the gas in said pipes, which temperature is further reduced, as herein shown, by permitting the gas in the pipes b^2 to pass in a restricted quantity into an expansion chamber. In the present instance the outlet end of the refrigerating coil b^2 is shown as connected to two chambers b^3 b^4 (see Fig. 2) of substantially large capacity to effect a reduction in the pressure and temperature of the gas, and which are provided with removable surfaces, preferably metal plates, b^5, which are staggered to obtain an irregular passage of the gas from the point of entrance to the outlet of the said chambers.

The plates b^5 are preferably removable from the top of the apparatus. The extracting chambers b^3 b^4 may be connected by the branched outlet pipe b^7 with the gasholder a^6, and the branches of the inlet pipe may be provided with valves b^9 b^{10}, which in practice may, and preferably will, be automatically operated by the pressure in the extracting chambers, but which are herein represented as hand operated valves.

The gas may, and preferably will, be passed through one chamber, as b^3, to the holder a^6, while the other chamber b^4 is cut off from the coil b^2 by closing the valve b^{10}, and so, also, the chamber b^3 may be cut off from the coil b^2 by closing the valve b^9 when the gas is passing through the chamber b^4. This arrangement permits the deposited naphthaline in one chamber to be removed while the naphthaline is being deposited in the other chamber.

The inventor's claims are :

1. The combination with a gas producing apparatus, including a gas generator and a holder, of a naphthaline extracting apparatus intermediate of said generator and holder and comprising a refrigerating apparatus connected to said gas generator, and an expansion chamber having its inlet connected to the refrigerating apparatus and its outlet to the said holder.

2. The combination with a gas producing apparatus of a naphthaline extracting apparatus comprising means to reduce the temperature of the gas, and a chamber provided with a removable surface upon which the naphthaline is deposited.

3. The combination with a gas producing apparatus, of a naphthaline extracting apparatus, comprising a refrigerating apparatus through which the hot gas is passed, and a chamber connected to the refrigerating apparatus and provided with a plurality of removable plates or surfaces arranged in the chamber to obtain a staggered effect and upon which the naphthaline is deposited.

4. The combination with a gas producing apparatus, of a naphthaline extracting apparatus, comprising means to reduce the temperature of the gas and a chamber provided with an obstructing surface upon which the naphthaline is deposited.

Correspondence

[The JOURNAL is not responsible for the opinions expressed by correspondents.]

Conclusions Concerning Inclined Retorts Deduced from Papers and Discussions Thereon at the Latest Meetings of the "Institution of Gas Engineers," and the "Incorporated Gas Institute."

NORFOLK, VA., July 16, 1898.

To the Editors AMERICAN GAS LIGHT JOURNAL :

As it is thought that in the memberships of the Associations above-mentioned are embraced the names of many of the foremost gas engineers of our time, the proceedings of these two are always carefully scanned by those on this side of the Atlantic who earnestly desire to increase their own knowledge, and whose time and means may permit them to indulge in that laudable ambition. It is, therefore, with a peculiar mixture of disappointment and *satisfaction* that the author read what was said at the last June meetings of these august bodies, concerning an improvement in coal gas manufacture which presents three strong claims to our consideration, viz. :

According to the testimony of those who have used the system with steadily increasing success for a number of years we are assured that : First, it has reduced the retort house operating expenses from 50 to 70 per cent.; second, it has entirely removed the ofttimes serious difficulty to procure adequate retort house labor ; third, it has won the favorable commendation of the laboring men themselves wherever introduced ; as witness, for example, that at Copenhagen. When the inclined retort system was introduced there upon a large scale, to the exclusion of manual and machine stoking, the Socialist leader of the Workingmens' Federation personally thanked Mr. F. D. Marshall, the engineer who introduced it, for thereby lightening the labor of the men. One would suppose that engineering societies whose labors are limited to the practice of and researches concerning one specialty only would long ago have agreed upon certain standard forms of comparisons, so that results, cause and effect could be satisfactorily determined without resort to confusing argument. Happily that matter has been taken up and considerable progress made, but there is still a deal of uncertainty to be met with, as was shown in the discussions at the meetings referred to, as shall be seen presently. Portions of the discussions remind the writer of nothing so much as a part of one of the "Relations" found in the works of the Swedish seer, Emanuel Swedenborg, where he describes an interview with a member of a spiritual society which he calls the "Confirmers," and whose chief distinction consisted of an ability to so view anything that it would always apparently agree with what they would like it to be. Swedenborg relates that he asked this spirit if he could prove a crow to be white? He was told that nothing was easier ; all one had to do was to pluck his feathers and he *was* white. In connection with this pardon the writer for digressing just a bit, to remark he always thought it a great pity the same authority did not, in his interview, substitute the American of African descent for the crow. He might perhaps have earned a nation's thanks, not forgetting the Africans.

With the abundant evidence before these Associations, one was warranted in hoping that the question of which was best would have become settled beyond further argument.

Apparently it was not so settled, and that is a reason for our disappointment, which, however, is more than neutralized by the fact that really the question was settled, and entirely in favor of the inclines, as a critical analysis of the papers and discussions will prove. The JOURNAL has published the papers, but not the discussions ; and as these cover many pages of the English *Journal of Gas Lighting*, I will confine myself to quoting only the most salient points made bearing upon the inclines, though it may well repay the student who has the necessary leisure to go over the whole of them.

There seemed to have been done a good deal of what we over here call "straddling," and also more or less of that which a political writer a long time ago called "swinging around the circle," during the arguments upon the merits or otherwise of the inclined retort system. This may become more apparent as we proceed, and consequently these comprehensive phrases may pass without further explanation ; but there was neither "straddling" nor "swinging around the circle" in the following words of Mr. Colbet Woodall, who it may be easily admitted stands not second to any other gas engineer anywhere. Said Mr. Woodall, in closing on behalf of Mr. E. Drory, of Berlin, who was not present : "All questions as to construction, durability, etc., were now relegated to the limbo from which they would not return ; and the remaining questions were rather that of first cost and incidental charges for interest and working expenses, as compared with horizontal retorts, whether hand worked or by machinery. That the system, as a system, would work perfectly satisfactory, there was now abundant evidence," etc.

This was the most notable, though not by any means only exception to the confessed uncertainty on the part of certain gas engineers who could reasonably be expected to be fully informed upon such an up-to-date issue, which is, moreover, so-to speak, to be seen at their very doors. And besides it is difficult at long range to reconcile what some of the gentlemen said with what some of those same gentlemen are doing, viz., using inclines, and after having used them, increasing the inclined plant, yet professing uncertainty at the meetings in a matter it seems to have been their duty to be quite sure of before going into it. The writer believes that these gentlemen did what they knew was best when they adopted inclines, else they would not now be actually increasing the system, as some are doing. But, possibly, they do not want to hurt the feelings of the parties who have really good stoking machines to sell, and so say to them practically, "Your machines are unquestionably good, but in the light of this later improvement they are really not up-to-date any longer." In the discussions of the papers there were some flat contradictions, and we shall refer to some of them specifically ; but it will be seen that only one conclusion is possible to the intelligent gas manager, and that conclusion will be, "The inclined retort system has commonsense on its side, and is the one most suitable for the manufacture of coal gas."

In his opening address, President G. E. Stevenson, of the Incorporated Institution of Gas Engineers, remarks : "The modification of the

carbonizing plant known as the inclined retort system has, during the past six years, gradually acquired importance, both in England and abroad. Accompanied in the first attempts by difficulties and disappointments, it has fought its way to a firmer position, and now bids fair to become more and more universally adopted. No doubt exaggerated claims have been made on its behalf; but it cannot, I think, any longer be denied that it possesses certain very definite advantages, more especially for works the magnitude of which is not sufficient for the full development of power stoking machinery. Even in competition with stoking machinery, it is my belief that the inclined system is destined to display a distinct advantage."

A little further on Mr. Stevenson says: "That up to the present time no absolutely reliable proof has been forthcoming that inclined retorts possess this economical advantage over machine stoking, I regard as due to the fact (?) that as yet no installations of inclined retorts have been worked on a sufficiently large scale, and under such propitious circumstances as have for some time past attended mechanical stoking."

It is a fact that within about one hour's ride of where that meeting was held the inclined system has been operated on a sufficiently large scale, and for a long enough period, to satisfy anybody—except the President, shall we say?

The works of the Brentford Gas Company are here referred to by the author, who wishes to speak only of what he has himself seen. "And there are others." But a man as busy as the President no doubt is with the many duties he has to perform may be easily excused if he over looks something; and it is not intended to imply that he wilfully overlooked this matter, but merely to point out that while intending to be fair and impartial to the new system, yet inconsistencies crept in for which due allowance should be made.

In the discussion of the papers, the President proved that he knew more about the subject, from experience, than the second quotation above would indicate, if one went no further; but, indeed, the first paragraph covers the ground equally well.

The first paper presented was by Mr. E. Drory, and was republished in this JOURNAL, and he gave some sound advice on the proper method to be observed when installing inclines. If your readers will refer to Vol. LXV., pp. 808–809 (Nov. 23d, 1896), they will find Mr. Drory's idea of a retort house illustrated, and most of his present suggestions printed. Mr. Drory, who has made inclines a study for nine years past, very kindly furnished the information referred to at the time, for use of the American Gas Light Association, through the writer of this present article.

The second paper was by Mr. F. D. Marshall, and as it also was reprinted in the JOURNAL, the reader can see for himself what Mr. Marshall gave us.

In the course of the discussion Mr. Marshall expressed himself favorably toward the inclines in the following language—as reported: "He had had a mechanical stoker; but after some time determined it should be the last. He, however, would have inclined retorts the next time."

As to first cost. While in the paper Mr. Marshall states that the inclines cost 50 per cent. more than horizontals—which statement was made much of by others who evidently were advocates of stoking machinery—in the discussion Mr. Marshall is quoted as follows: "It was an expensive setting, for the reasons he had told them. They had heavy royalties to pay; *but when the patents lapsed, inclined retorts could be put up just as cheaply as horizontal ones.*"

It is hoped that the reader will carefully note *that* reason so frankly given by Mr. Marshall, in which he was supported by Mr. S. Y. Shoubridge, who said not only that the inclines could be put up as cheaply, but more so than horizontals; and therein both gentlemen flatly contradicted the advocates of other appliances who would have the 50 per cent. increase in the cost of the inclines, despite the facts presented by those who had experience with the system.

It must be admitted that Mr. Marshall's statement of results, while satisfactory to himself, and perhaps really so when local conditions were understood, are not such as to make a most favorable showing for the inclines, notwithstanding Mr. Marshall's own good opinion of them; excepting alone his fuel used per 100 pounds of coal carbonized.

With coal yielding 10,800 cubic feet of gas per ton, Mr. Marshall obtained but 8,316 cubic feet per retort and day.

The writer, with coal yielding 10,976 cubic feet per ton, obtained a yearly average of 9,123 cubic feet per retort and day, in a certain bench with 20 settings of 5 retorts per oven; retorts 8 ft. 3 ins. by 22 ins. by 14 ins. inside measurement, fired by the old style grate bar furnace, and charged in the good, old-fashioned way with scoops, and by hand.

If he had not been certain to do very much better than this, he would never have given inclines a second thought.

But after noting the results of Messrs. Drory, Husband, Herring, Shoubridge and many others, the small retort (though otherwise excellent) results of Mr. Marshall will not discourage anyone inclined to use the latest, up-to-date method for carbonizing gas coals.

The discussion of the Drory and Marshall papers on the inclined retort system was participated in by eleven members, including the President of the Association, and one of the authors. It was shown that short retorts were very good in the inclined system—in fact, Mr. Marshall would not use any others; and it was further proved by a majority of the debaters that long retorts not only presented no difficulties, but were decidedly preferred by some of the gentlemen. Some of these engineers who had used short retorts were now using longer ones, and found that the latter worked well. Indeed some of these who were at the time putting down still longer (20 feet) retorts appeared to be in doubt as to which were best.

We must conclude, then, that the plan of long or short retorts, set at a proper angle and letting gravity do the work, instead of using expensive and complicated machinery to effect it, is the proper caper in up-to-date retort house practice.

Mr. Marshall stated one of the drawbacks of the inclines to be the rapid accumulation of "scurf" in the upper ends of the retorts; and it was pointed out that that was probably a cause of falling off in yield and illuminating power when using inclines. Though Mr. Marshall himself had not noticed either in his practice; but merely stated it might be so. And others agreed with the theory.

Mr. Shoubridge said: "He had worked on inclined retorts for some time, had taken careful tests of the illuminating power as well as make, and found no diminution."

Mr. Shoubridge, who was the Chief Engineer and Manager of the Salford Corporation Gas Department, is now the engineer of the Crystal Palace District of the South Metropolitan Gas Company, directly under Mr. Geo. Livesey; and his ability as a gas engineer is unquestioned at home where he is known. Hence we must conclude there is nothing in the "drawback" referred to by Mr. Marshall, since he and others only thought it might exist, whereas one who had given it close attention, and to say of at least equal ability, said it did not.

Mr. Carpenter said inclines required scurfing every three weeks. If he also has horizontal retorts, and is getting out of them what American practice would require, and does not have to scurf them quite as often, it would be remarkable; but, as Mr. W. R. Herring very sensibly pointed out, the item of scurfing is affected a good deal by the depth of seal and amount of pressure carried in the hydraulic main.

Mr. Herring so far thought the inclined system to be the best that he advised his commissioners to put down nothing else at the new works, which the Edinburgh and Leith Corporations are about to erect.

Mr. C. C. Carpenter seemed rather to advocate stoking machinery, but as he uses inclines largely—and, it is safe to say, will not substitute stokers for inclines—we probably misunderstand him as to what he really meant to say.

Mr. R. Brown, speaking to Mr. Drory's paper, is quoted as follows: "He was surprised that the author (Mr. Drory) relied on the intelligence of the workmen for the amount of coal put into retorts. He (Mr. Brown) looked upon the success of the system as being due to the fact that the charges were under the direct control of the foreman; and when once they were set the workman had only to pull a lever."

And that again accords with the writer's own observation when abroad and studying the subject at the various works visited, including Mr. Drory's.

Mr. Braidwood, of Greenwich, said, speaking of the inclined system: "There was no elaborate machinery to get out of repair, and in the retort house there was no danger of a sudden breakdown of machinery. There were all the advantages of the machine, coupled with the security of hand labor. * * * Everybody would find some difficulty in commencing; but he would be able to overcome them."

The slipping of coal after it was in the retort was considerably gone into. And it was shown that some coal would slip a great deal and some none at all; for where some members had trouble from the tendency of the coal to slip, others had none whatever. It was also pointed out that if coal which melted like wax when put into the retort had been mixed with some other kind that did not, then the difficulty would have been practically overcome.

"Field's Analysis" was quoted in one of the papers as proving something against the inclines, which, when resolutely questioned by Mr. Shoubridge, turned out to have proved nothing of the kind; and that the story rested upon the ex-parte opinion of a gentleman, given some time ago, and who has evidently changed his own mind upon the subject since.

An advantage with the inclines—that there are no stopped pipes with it, for so Mr. Marshall and others claimed—we will dismiss as one not safe to claim as a general thing. In the writer's limited practical experience with inclines, he has had more stoppages than he thought convenient or desirable, and he can see no reason why, coal and heats being equal, there should not be as many stopped pipes with the inclined as with any other system. But it is claimed there are not so many.

It is to be regretted that the discussions as printed in the *Journal of Gas Lighting* could not be given as a whole, but it is hoped that which is given may warrant the conclusions drawn by the writer as set forth in this article.

The proceedings of "The Incorporated Gas Institute," though seen, are not at hand at present, and if thought desirable will be reviewed at some future date; but we may quote from the opening address of the President, Mr. James Stelfox, concerning the inclines, the following: "These labor-saving appliances must be reckoned to include the use of the inclined retorts, which came upon us with a boom some 13 years ago, and seemed likely to take possession by storm of every gas works in the kingdom. The adoption of the system seemed, however, to receive a decided check; and no doubt it has contributed very largely to that omnivorous receptacle, the scrap heap. Nevertheless, as in the case of many other systems, out of that portion of the heap a vast amount of experience has been evolved; and at the present time slopers seem likely to have a much more prominent place in gas works construction than the one they have till lately occupied."

The *Journal of Gas Lighting* (June 28th), remarks editorially, in reviewing the proceedings of the Institute:

Mr. S. Y. Shoubridge's paper describing the inclined retort installation at Salford was afterwards taken, and proved to be a sweeping claim for the super-excellence of this system of carbonizing coal; and it was, of course, quite as warmly challenged. This discussion also was most lively and businesslike. The inclined retorts came very well out of the ordeal—almost too well, indeed, because the advocates of the alternative practice had very little to say for the older plan that had not been heard before.

Truly yours,

FREDERICK EGNER.

ITEMS OF INTEREST FROM VARIOUS LOCALITIES.

REFERRING to our mention, in the July 4th issue of the JOURNAL, that Mr. Albert F. Jenkins, son of Mr. E. H. Jenkins, of the Buffalo (N. Y.) City Gas Company, had been appointed Superintendent of the Athens (O.) Gas and Electric Company, Mr. C. H. Welch, Manager of the latter Company, says we were in error. Mr. Jenkins has been employed by the Athens Company, but not in the capacity of Superintendent, or other official station.

THE New Haven (Conn.) Gas Light Company has placed a contract with the Berlin Iron Bridge Company, of East Berlin, Conn., for a new fireproof coal shed. The building is to be 60 feet wide and 500 feet in length, and it is to have a framework of steel so arranged that the coal cars are brought in on a track supported by the roof trusses. This scheme proposes to provide the maximum of storage commensurate with a minimum expenditure of power and room.

ABOUT a fortnight ago the case of Bankson Taylor vs. John B. Meagher was heard before Judge Severance, in chambers, at Mankato, Minn. None but the parties interested and their witnesses were present. The suit is over $50,000 of the stock of the Mankato Gas and Electric Light Company, which Mr. Taylor claims is due him under an agreement between himself and Mr. Meagher, by which the former agreed to put the defendant into possession of certain securities of the Company. Practically the contest is for the control of the Company, and the result is looked forward to with interest. The case will be argued within the next few weeks.

THE Directors of the Mankato (Minn.) Gas and Electric Light Company have perfected the following executive organization: President, John B. Meagher; Vice President, Felix K. Meagher; Secretary and Treasurer, R. E. Brown; Superintendent, Henry M. Hunt.

THE Jackson (Mich.) Gas Company is making important extensions to its main system, arrangements having been entered into for the placing of at least 3 miles of suitable sized pipe.

MR. ANDREW SIMS, for many years a faithful employee of the old Pittsburg (Pa.) Gas Company, died at his home in Pittsburg about a fortnight ago. He was in his 65th year.

THE proprietors of the Trenton (N. J.) Gas Light Company have named Mr. Henry C. Taylor to the dual position of Secretary and Treasurer. Mr. Taylor's main business qualifications, so far as his actual trading experience goes, for entrance into the gas industry, are: He has been Manager of the Taylor Opera House, of Trenton; also a "large stockholder" in the Taylor Provision Company, likewise of Trenton.

THE Landis Banking Company, of Nashville, Tenn., make the following self-explanatory statement: "We will buy your privilege to subscribe for the increased issue of stock in the Nashville Gas Light Company, whether it be for whole shares or fractional parts. If you prefer to not take stock, and pay for your pro rata of the new stock, see us. We can make it to your advantage."

THE annual meeting of the Bridgeton (N. J.) Gas Light Company was held on the 14th inst. The Directors chosen were: Chester J. Buck, H.W. Elmer, Daniel Bacon, George H.Whipple and Samuel P. Fithian. The Board subsequently organized by appointing the following executive management: President, Daniel Bacon; Secretary and Auditor, H. W. Elmer; Superintendent and Treasurer, B. F. Harding. A resolution was also adopted reducing the selling rate to $1.20 per 1,000 cubic feet—a concession of 5 cents per 1,000. During the term of the present management of the Company (which covers a period of 25 years) the selling rate has been reduced from $4 per 1,000 to $1.20, and the end is not yet.

A VERY effective installation of Welsbach lamps for street lighting has been made on Hancock street, Brooklyn, N. Y. The lamps and equipment are of the newest pattern, and the residents of the district thus lighted are much pleased with the change from the ordinary open flame burner hitherto used.

THE Board of Trustees of Franklinville, N. Y., have granted a franchise for the operation of a gas plant in that place. We fear it will be some time before the works shall be an accomplished fact.

AT the annual meeting of the Spencer (Mass.) Gas and Electric Company it was decided that the Directors be authorized to arrange for a reorganization of the Company, their report respecting the plan of reorganization to be submitted to the shareholders at a time not later than October 1st. The reorganization is a necessity through the terms of the mortgage, which is due and redeemable Jan. 1, 1899.

THE officers elected by the Company were: Directors, Luther Hill, E. A. Hill, T. F. Stone, Erastus Jones, Ed. E. Evans, L. N. Sagendorph, Dexter Bullard, George P. Ladd and H. D. Trask; President, Luther Hill; Vice-President, Erastus Jones; Treasurer, E. A. Hill; Clerk, Emerson Stone.

THE Torrington (Conn.) *Register* of recent date, had this to say: "Mr. C. H. Nettleton, of Derby, Conn., who has been in Torrington at different times looking over the ground for the Electric Light Company here with a view to the establishment of a gas plant, has made his report on the matter. It is a very favorable one, and another summer will probably see such a plant in active operation. The plans of the Electric Light Company have not been fully made out; it is their present intention to build the plant next to their electric plant on the East Branch. They will manufacture water gas according to the Lowe system, and will pipe the residence as well as the business section of the town. This action of the Company is taken in view of the growing demand for gas in the community, and the assurance that unless the Electric Light Company put in such a plant other parties stood ready to do so. One of the principal demands has been that of house burners for gas ranges for cooking, such as are being extensively adopted in other towns and cities where gas is used, and which have been found to be very economical and convenient. The capital stock of the Electric Light Company will be increased from $12,000 to $100,000 or $150,000, by subscription, and the gas plant will be one of the best equipped in the State. The Electric Light Company's plant is now in good shape, and although the capital stock is but $12,000, there is in the neighborhood of $30,000 invested in the plant."

At the annual meeting of the Oswego (N. Y.) Gas Light Company, the officers chosen were: Directors, Henry G. Ludlow, James Dowdle, R. G. Post, John T. Mott, Thomas Kingsford, Henry S. Wright, Theodore Irwin, H. H. Lyman and T. P. Kingsford; President, James Dowdle; Secretary, Robert G. Post; Vice-President and Treasurer, Jno. T. Mott.

The Pittsfield (Mass.) Coal Gas Company is making notable additions to its generating plant.

The Board of Directors of the Louisville (Ky.) Gas Company recently completed the following executive organization: President, George W. Morris; Vice-President, John Stites; Secretary, E. S. Porter; Treasurer, W. P. Lee; General Manager, A. H. Barret; Executive Committee, J. M. Atherton, H. V. Loving and J. B. Speed. A dividend of 2 per cent., payable out of the earnings for the first half of the year, was declared. The financial statement showed that 3¼ per cent. had been earned.

Messrs. George F. Payne & Co. have been awarded the contract for the construction of the United Gas Improvement Company's office building, which, as before reported in the Journal, is to be erected at the northwest corner of Broad and Arch streets, Philadelphia.

We are told there is no truth in the report that the owners of the Hazelton (Pa.) Gas Company had agreed to sell that property to the proprietors of the West End Electric Light Company, of Hazelton.

At the annual meeting of the Haverhill (Mass.) Gas Company the Directors elected were: John E. Gale, W. K. Stratton, Henry H. Gilman, L. L. H. Taylor, W. H. Moody, Dudley Porter and U. A. Killam.

The Yuba Power Company, of Marysville, Cal., is said to be building a gas works in that city.

At the annual meeting of the Peoples Gas Light Company, of Rutland, Vt., the matter of bonding the property in the sum of $25,000, which amount was to be devoted to making plant extensions, was considered at great length. The proposition was eventually referred to the Board of Directors, with power. The Directors elected were: S. M. Willson, J. W. Cranston, E. E. Keyes, G. H. Verder, E. C. Lewis and C. W. Mussey.

According to permits recently issued by the Board of Highway Supervisors of Philadelphia, the United Gas Improvement Company proposes to put down 12 miles of mains, in streets now without pipes. The mains will extend as far north as New street, Chestnut Hill; on the south, as far as Moore street; on the west, as far as 61st street; and on the east as far as Delaware avenue.

It is reported that Scranton (Pa.) capitalists have secured a controlling interest in the Carbondale (Pa.) Gas Company.

Superintendent Thomas, of the Vallejo (Cal.) Gas Company, is a busy man just now. He is repairing the breaks in the Company's mains caused by the earthquake in that section of California some weeks ago.

A correspondent at Los Angeles, Cal., forwards the following, under date of the 8th inst.: "The plant of the San Bernardino (Cal.) Gas Company has passed into the possession of Mr. C. R. Lloyd, the purchase price being returned at $20,000. The gas and electric light plants are now owned by one corporation, thus giving to the San Bernardino Electric Company a monopoly of the street and commercial lighting of the city. It is rumored that the local Company has in turn been absorbed by the Southern California Power Company, and if this be true that huge corporation will have full control of every electric plant and all water power that can run an electric plant between Redlands and Los Angeles."

Advices from Chicago are to the effect that Waukegan, Ills., will soon have a gas works after several failures to complete projected systems. The rights and stock of the old Company, which laid several miles of mains, but failed to build the works, have been purchased by Louis M. Grant, of Chicago. The Waukegan Council has extended the time for operating the works until October 18. Mr. Grant will organize a Company at once, and proposes to expend about $50,000 in erecting the plant and completing the system.

The Newark (N. J.) Company has been sold to a syndicate, who will assume control as soon as the necessary legal formalities have been carried out. The price paid was $310 per share for the capital stock (it amounts at par to $1,000,000), the purchasers to assume the existing bonds, which amount to $4,000,000.

It is said that the Universal Gas Company, of Chicago, has arranged for the construction of a holder rated to retain 5,000,000 cubic feet.

It may safely be said that the conflict between the Peoples Gas Light and Coke Company, of Buffalo, N. Y., and the Buffalo City Gas Company, is at an end. In the rearrangement of the system it is likely that the charter of the Peoples Company will be used.

The Board of Chosen Freeholders has authorized the Morristown (N. J.) Gas Light Company to light the road between Morristown and Madison with gas lamps, at the rate of $25 per lamp per annum. Four feet burners are to be used, and the lighting table is on the basis of every night and all night service.

The Kansas City, Missouri, Gas Company, has offered to maintain an all night and every night gas street lamp service, at the rate $18 per lamp per annum.

Coal Mining in China.

Engineering says that for a considerable time past various groups of capitalists have had their eyes upon the vast deposits of coal in different parts of China, and attempts have been made to obtain concessions for working them. It is now stated, on what seems to be good authority, that a concession has been made by the Chinese Government to an English syndicate of what is probably the greatest coal field in the world, and which promises to give to British capital and British enterprise a commanding position in the development of the Chinese Empire.

The capitalists have assumed the name of the Pekin Syndicate, and it is stated that they have obtained ample powers to exploit the vast coal field in the Province of Shan-Si, which lies on the northeast of China, extending up to Mongolia on the north, bounded on the west and south by the river Hoang-Ho, and on the east by the Province of Chi-Li, containing the best anthracite coal, 250 miles long and 40 miles wide.

Alongside of the coal there are vast deposits of brown hematite and spathic iron ore, and an abundance of limestone, so that the concession is valuable not only as a coal field, but also as containing all that is necessary for carrying on the manufacture of iron on a large scale, and thus opening up vast possibilities in every department of industry.

The coal field is described by Baron von Richthofen, in his great work on China, as occupying a plateau between 2,000 feet and 3,000 feet above sea level, and he says that since no interruption of the continuity of the coal strata occurs, and at every place where the formation crops out on the surface, there may be assumed to be at least 40 feet of workable coal, a probable minimum amount of 630,000 million tons of coal can easily be calculated for the whole area.

If these calculations be correct the Chinese Empire will not come to grief through an early failure in her coal supply, but on the contrary, if her resources are properly developed and the resulting effects wisely guided, she may become the dominating power in the industrial world.

It is understood that the syndicate has obtained a concession to run for 60 years, with full powers to exploit for coal, iron and limestone in the district, with all railway, water and road rights, and with permission to construct a railway to join the main Chinese line from Pekin to the south, which is mapped out, and the construction of which has already begun. The concession includes the right to import machinery, free of all charge, with the exception of the ordinary customs duties at the port of entry, and in return the syndicate will pay the Vice-regal and Imperial authorities a royalty of 25 per cent. on the profits. It is understood that operations will start immediately and that already mining engineers are on the spot.

The coal field is in a most convenient position in every respect, being only 270 miles distant from Pekin; and as the Hoang-Ho or Yellow River is easily navigable from its mouth to the region in question, the coal and iron can be brought down the river by steamer and along the coast of Shan-Tung to Wei-Hai-Wei, the port which has recently been leased to Great Britain by China. Already speculations are being made that in the course of the next few years, Wei-Hai-Wei may become the center of a great iron industry, where iron rails can be rolled to supply the new railways of China, as well as a great coaling station for the British squadron on the Chinese station.

THE AMERICAN GAS LIGHT JOURNAL

A. M. CALLENDER & CO.,
PROPRIETORS.

THOS. J. CUNNINGHAM,
ELBERT P. CALLENDER,
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CHAS. E. SANDERSON,
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MONDAY, JULY 25, 1898.

The Market for Gas Securities.

The market for city gas shares was very narrow during the week, although prices were fairly well maintained. In fact, Mutual showed a good advance. Consolidated opened to-day (Friday) at 196¾ to 197, and the Standard specialties are at the figures of last week. There is no particular change in the local situation, although the signs are that progress towards consolidation is being steadily made.

Brooklyn Union sold off to 121, and Peoples, of Chicago, advanced to 98¾. Baltimore Consolidated is steady, at 64 to 64½, and Bay State remains lifeless, at 3 to 3½. The market is now of the regular midsummer order, and lethargy is likely to be the rule for perhaps a month.

Gas Stocks.

Quotations by Frederic B. Cochran & Co., Brokers and Dealers in Gas Stocks.
20 AND 22 BROAD STREET, NEW YORK CITY.
JULY 25.

☞ All communications will receive particular attention
☞ The following quotations are based on the par value of $100 per share.

N. Y. City Companies.	*Capital.*	*Par.*	*Bid.*	*Asked.*
Consolidated	$36,230,000	100	196¾	197
Central	500,000	50	..	..
" Scrip	220,000	..	100	.
Cental Union, Bonds, 5's	3,000,000	1,000	99⅛	100
Equitable	4,000,000	100	206	215
Bonds, 6's	1,000,000	1,000	105	..
" 1st Con. 5's	2,300,000	1,000	114	.
Metropolitan Bonds	658,000	..	108	112
Mutual	3,500,000	100	330	337
" Bonds	1,500,000	1,000	100	102
Municipal Bonds	750,000	.	..	..
New Amsterdam Gas Co.	13,000,000	100	30¼	31
Preferred	10,000,000	100	75	75½
Bonds, 5's	11,000,000	1,000	102	102¼
Northern	150,000	50		
" Bonds	150,000	1,000	..	
Northern Union, Bonds, 5's	1,250,000	1,000	94½	95½
New York and East River	5,000,000	100	81	84
Preferred	2,000,000	100	112	115
Bonds 1st 5's	3,500,000	1,000	112	114
" 1st Con. 5's	1,500,000	..	108	108¼
Richmond Co., S. I.	348,650	50	70	..
" Bonds	100,000	1,000	..	..
Standard	5,000,000	100	138½	141
Preferred	5,000,000	100	152	157
Bonds, 1st Mortgage, 5's	1,500,000	1,000	112	114
Yonkers	299,65	500	180	
Out-of-Town Companies.				
Brooklyn Union	15,000,000	100	120	121
" " Bonds (5's)	15 000,000	1,000	114	115
Bay State	50,000,000	50	3	3½
" Income Bonds	2,000,000	1,000	..	75
Boston United Gas Co,—				
1s Series S. F. Trust	7,000,000	1,000	..	92
2d " " "	3,000,000	1,000	70	..
Buffalo City Gas Co.	7,000,000	100	23½	24½
" " Bonds, 5's	7,000,000	1,000	95½	96
Central, San Francisco	2,000,000	..	95	..
Chicago Gas Co. Guaranteed Gold Bonds	7,650,000	1,000	104	104¼
Columbus	1,069,000	.	89	91
1st Mortgage	1,085,000	..	101	103½
Consumers. Jersey City	2 000,000	100	75	80
" Bonds	500,000	1,000	100	103¼
Cincinnati G. & C. Co.	8,500,000	100	202½	203
Consumers, Toronto	1,600,000	50	184½	187
Capital, Sacramento	500,000	50	..	35
Bonds (6's)	150,000	1,000	..	..
Consolidated, Baltimore	11,000,000	100	64	64½
Mortgage, 6's	3,600,000	..	107	107½
Chesapeake, 1st 6's	1,000,000	..	..	..
Equitable, 1st 6's	910,000	..	..	..
Consolidated, 1st 5's	1,490 000	..	..	..
Consolidated G. & E. Co.'s, Little Falls, N.Y.	90,000	100	..	100
Bonds	75,000	..	..	100
Detroit	4,000,000		58	58½
" Con. Bonds	4,312,000	..	92½	93
Equitable Gas & Fuel Co., Chicago, Bonds	2,000,000	1,000	..	101
Fort Wayne	2,000,000	..	75	80
" Bonds	2,000,000	..	88	91
Hartford	750,000	25	..	145
Indianapolis	2,000,000	..	115	125
" Bonds, 6's	2 650,000	..	106	107
Jersey City	750,000	20	180	..
Lafayette Gas Co., Ind.	1,000,000	100	78	83
Bonds	1,000,000	1,000	90	91
Louisville	2,570,000	50	.	..
Laclede, St. Louis	7,500,000	100	50½	51
Preferred	2,500,000	100	91	92
Bonds	9,084,400	1,000	105	105¼
Montreal, Canada	2,000,000	100	200	..
Newark, N. J., Gas Co.	1,000,000	..	200	220
Bonds, 6's	4,000,000	..	128	130x
New Haven	1,000,000	25	252	..
Oakland, Cal.	2,000,000	..	53½	54
" Bonds	750,000	..	..	..
Peoples G. L. & Coke Co., of Chicago	25,000,000	100	98¾	98⅞
Peoples Gas Lt. & Coke Co., Chicago, 1st Mortgage	20,100,00	1,000	..	108
2d "	2,500,000	1,000	104	105
Peoples, Jersey City	500,000	50	..	175
Rochester Gas & Elec. Co.	2,150,000	50	..	..
Preferred	2,150,000	50	88	..
Consolidated 5's	2,000,000	..	87½	90
San Francisco, Cal.	10,000,000	100	94	94½
St. Paul Gas Light Co.	1,500,000	100	49	51
1st Mortgage 6's	650,000	..	84	87
Extension, 6's	600,000	..	..	..
General Mortgage, 5's	2,400,000	.	88	90
Syracuse, N. Y.	2,500,000	25	17	18
Bonds	1,000 000		94	97
Washington, D. C	2,000,000	20	250	..
Western, Milwaukee	4,000,000	100	85½	86
Bonds, 5's	3,556,000	.	101¾	102½
Wilmington, Del.	530,000	50	200	

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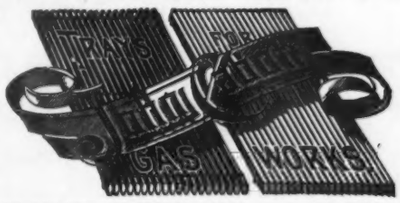

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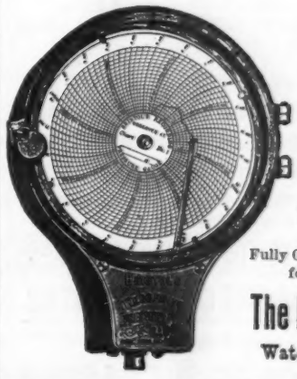

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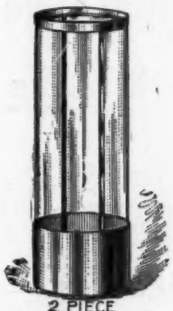

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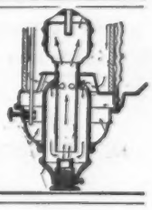

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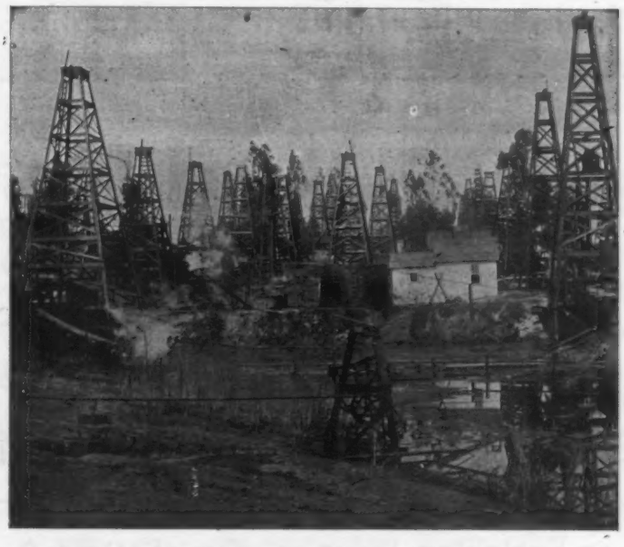

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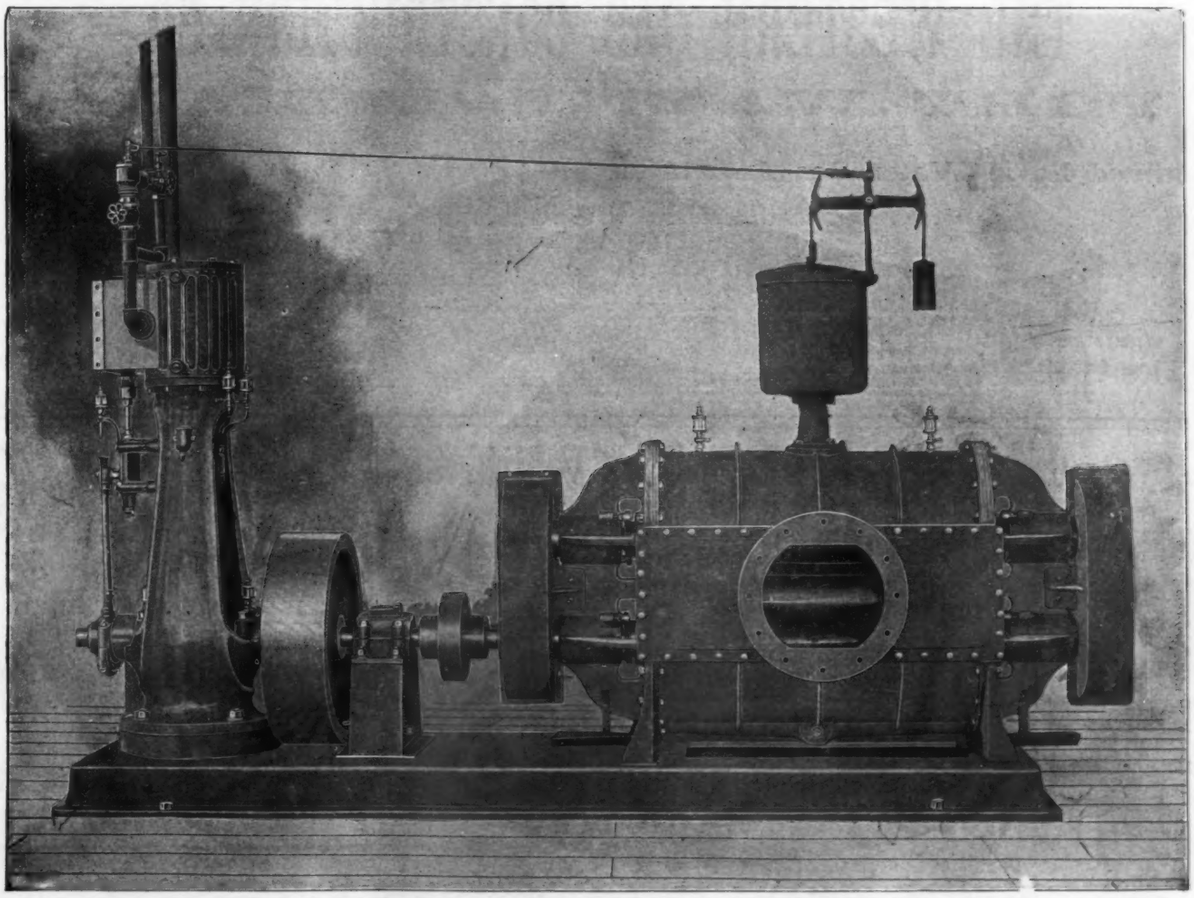

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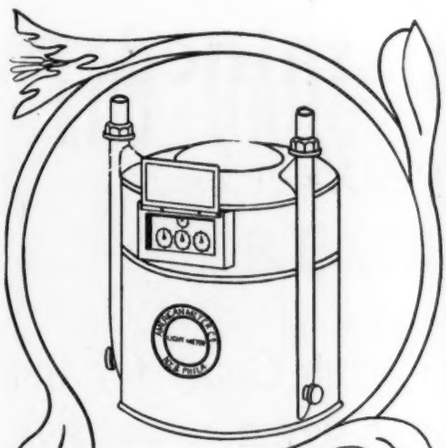

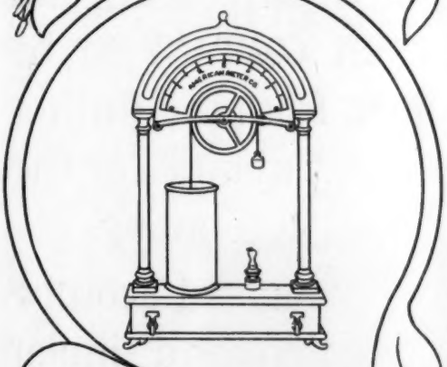

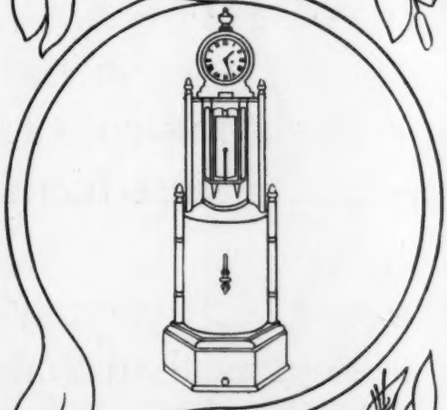

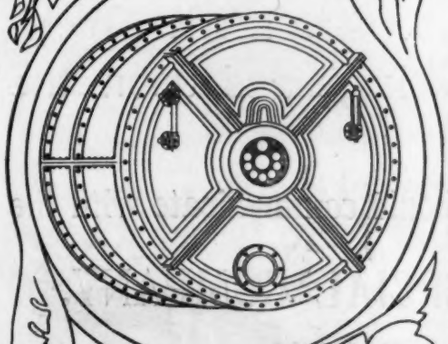

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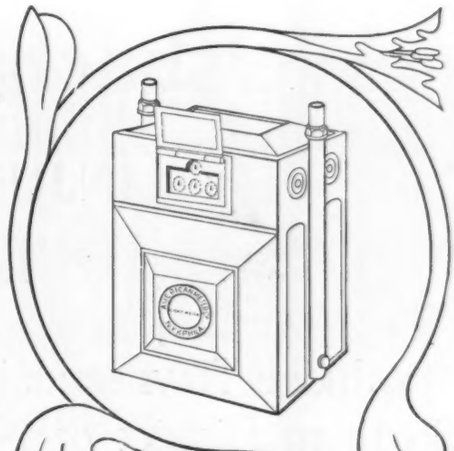
PUBLIC LIGHTING TABLE.

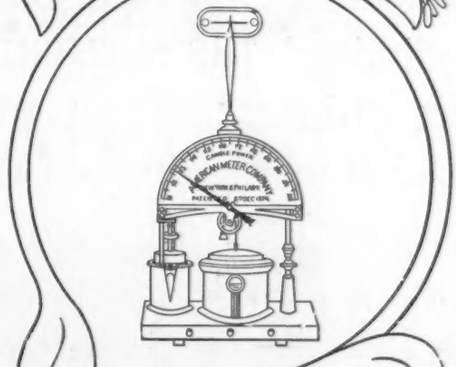
AUGUST, 1898.

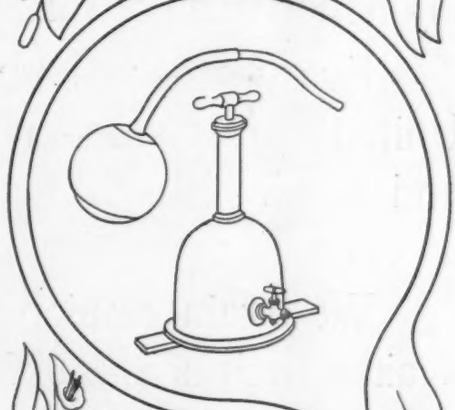
Day of Week.	Table No. 1. Following the Moon. Date.	Light.	Extinguish.	Table No. 2. New York City. All Night Lighting. Light.	Extinguish.
				P.M.	A.M.
Mon.	1	No L. FM	No L.	7.10	3.30
Tue.	2	No L.	No L.	7.10	3.30
Wed.	3	7.40 PM	9.00 PM	7.10	3.30
Thu.	4	7.40	9.20	7.10	3.30
Fri.	5	7.40	9.50	7.10	3.30
Sat.	6	7.40	10.20	7.10	3.45
Sun.	7	7.30	10.50	7.10	3.45
Mon.	8	7.30 LQ	11.20	7.10	3.45
Tue.	9	7.30	12.00	7.10	3.45
Wed.	10	7.30	12.40 AM	7.10	3.45
Thu.	11	7.30	1.30	7.10	3.45
Fri.	12	7.30	2.20	7.10	3.45
Sat.	13	7.30	3.20	6.55	4.00
Sun.	14	7.20	4.10	6.55	4.00
Mon.	15	7.20	4.10	6.55	4.00
Tue.	16	7.20	4.10	6.55	4.00
Wed.	17	7.20 NM	4.10	6.55	4.00
Thu.	18	7.20	4.10	6.55	4.00
Fri.	19	7.20	4.10	6.55	4.00
Sat.	20	7.20	4.10	6.45	4.10
Sun.	21	7.20	4.20	6.45	4.10
Mon.	22	8.00	4.20	6.45	4.10
Tue.	23	8.40	4.20	6.45	4.10
Wed.	24	9.30 FQ	4.20	6.45	4.10
Thu.	25	10.20	4.20	6.45	4.10
Fri.	26	11.30	4.20	6.45	4.10
Sat.	27	12.40 AM	4.20	6.30	4.20
Sun.	28	2.00	4.30	6.30	4.20
Mon.	29	3.20	4.30	6.30	4.20
Tue.	30	No L.	No L.	6.30	4.20
Wed.	31	No L FM	No L.	6 30	4.20

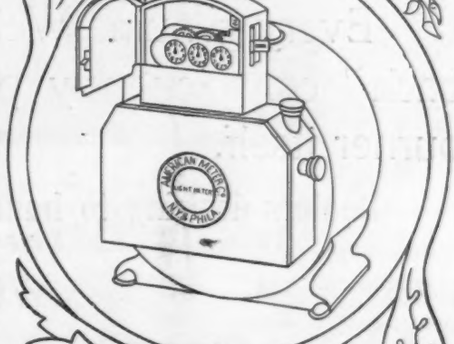
TOTAL HOURS LIGHTING DURING 1898.

By Table No. 1.	Hrs. Min.	By Table No. 2.	Hrs. Min.
January	210.40	January	423.20
February	186.40	February	355.25
March	181.20	March	355.35
April	166.10	April	298.50
May	156.40	May	264.50
June	144.30	June	234.25
July	147.30	July	243.45
August	157.10	August	280.25
September	169.50	September	321.15
October	186.00	October	374.30
November	204.30	November	401.40
December	218.30	December	433.45
Total, yr.	2129.30	Total, yr.	3987.45









Welsbach Patent Sustained.

INJUNCTION GRANTED.

Judge Townsend, in the United States Circuit Court for the Southern District of New York, has handed down a decision sustaining the Welsbach Light Company's Rawson patent, and adjudged **THE SUNLIGHT INCANDESCENT GAS LIGHT COMPANY** to be an infringer. This Company has been enjoined from the further use of its method of manufacture of incandescent mantles or the sale or use of the same, and ordered to render an accounting.

A further decision has been handed down by Judge Lacombe in the United States Circuit Court, granting a motion for a similar injunction against **THE REX INCANDESCENT LIGHT COMPANY.**

Every other manufacturer of incandescent mantles in the United States is under these decisions an infringer of this patent, and the Welsbach Light Company will proceed against them at once.

We again caution gas companies and the public generally against the purchase of any incandescent mantle other than that made and sold by the Welsbach Light Company or its agents.

Every genuine Welsbach lamp has the trade mark "Welsbach" conspicuously printed upon the package and upon the burner itself.

Dealers desiring to handle the genuine article should communicate with the

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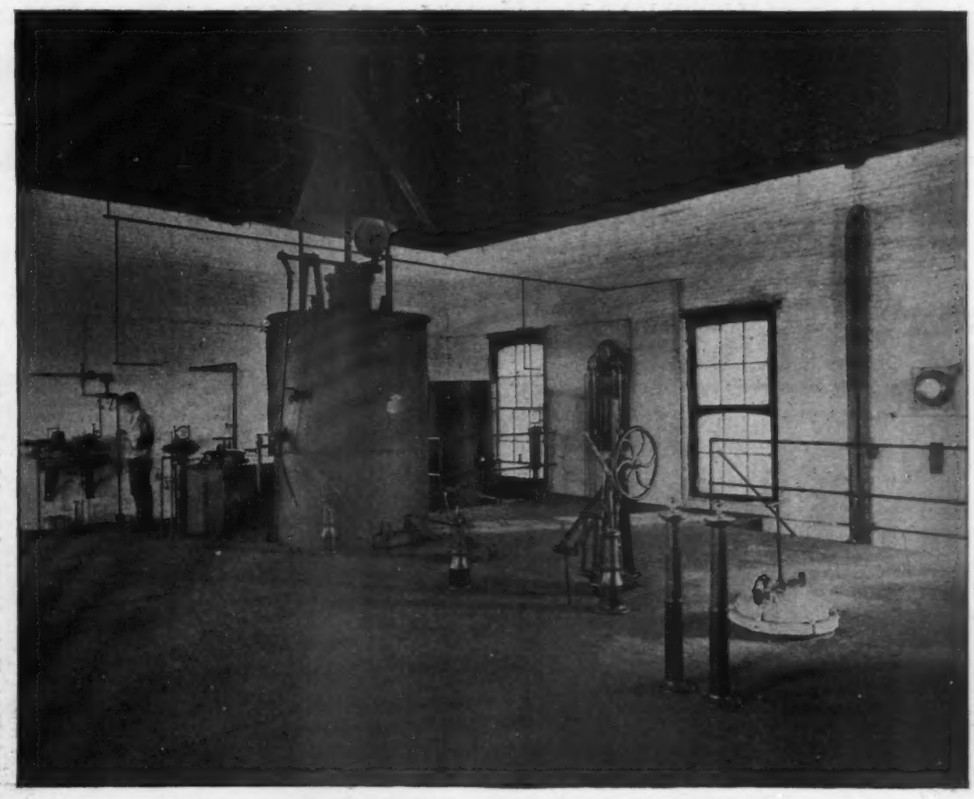
The United Gas Improvement Company,

DREXEL BUILDING, PHILA., PA.

The Standard Junior,

The Standard Double Superheater,

LOWE WATER GAS APPARATUS.



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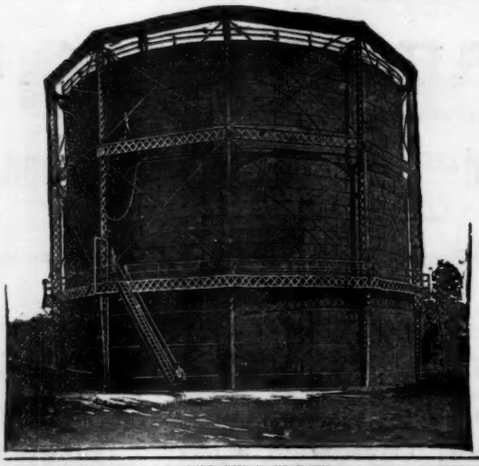

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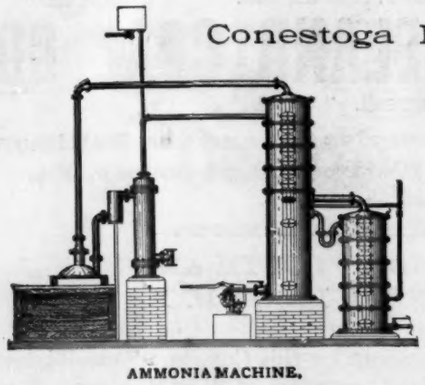

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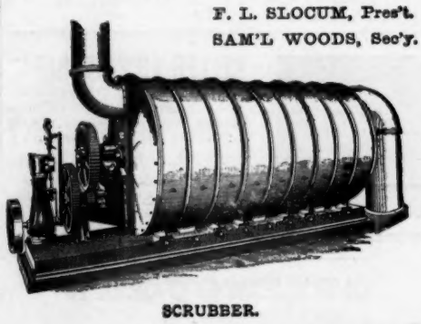

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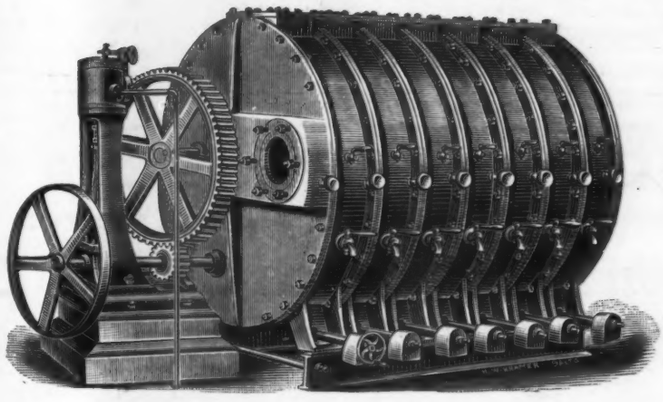

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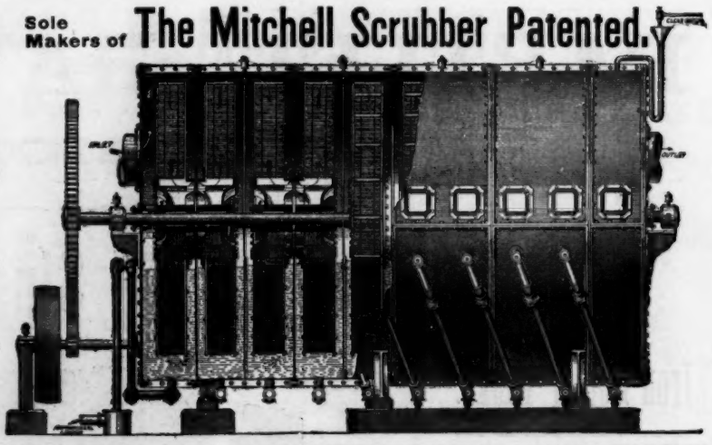

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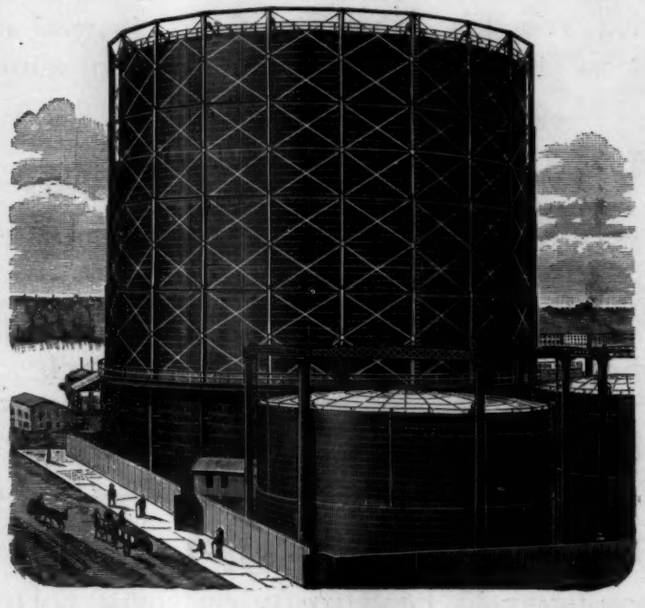

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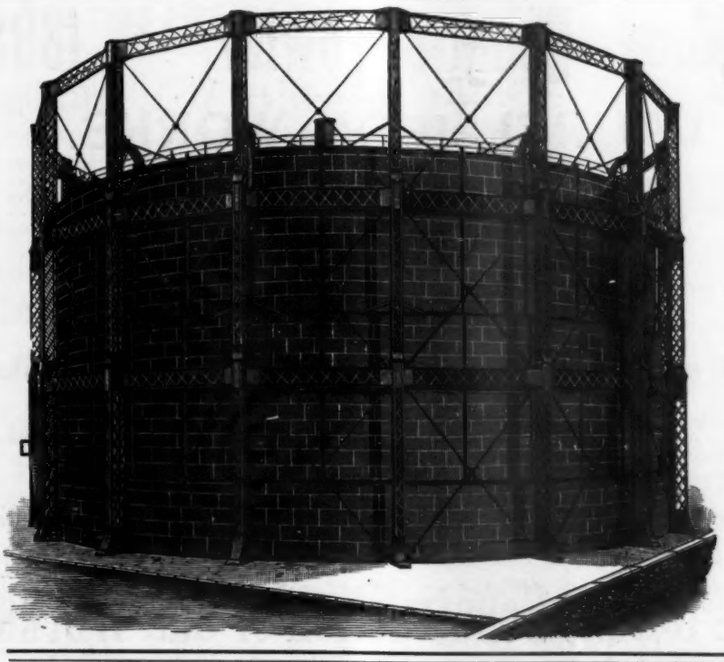

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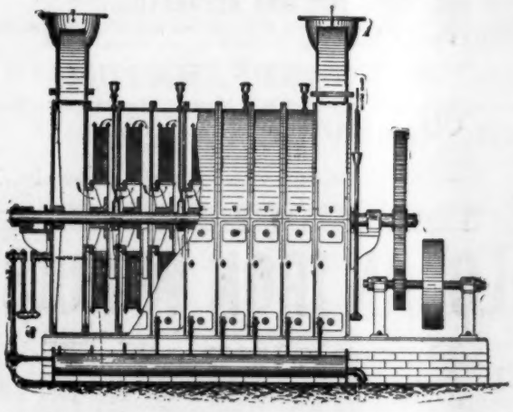

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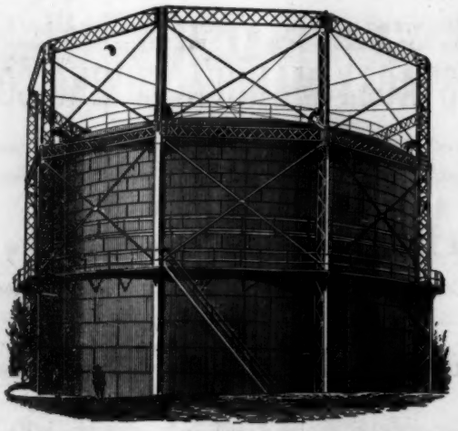

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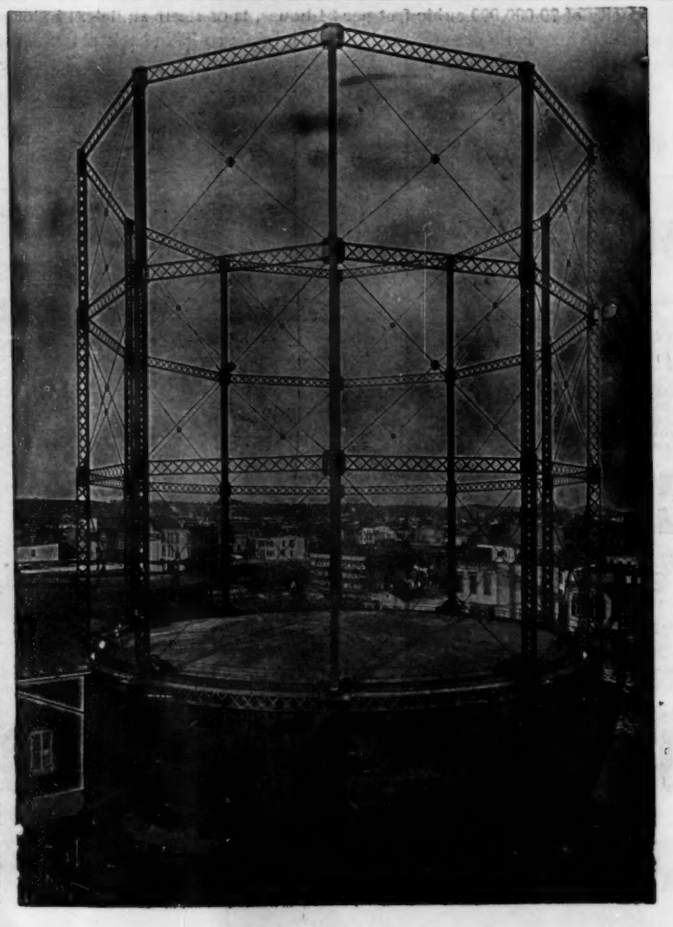

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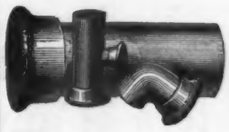

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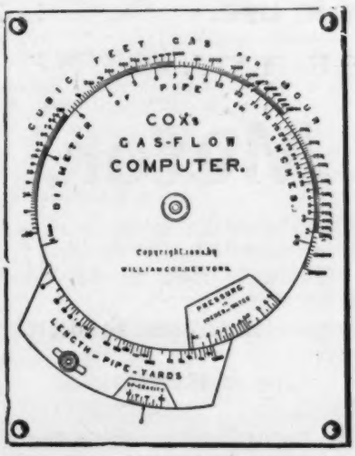

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